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# USG BUILT-UP ROOFING

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SPECIFICATION MANUAL



UNITED STATES GYPSUM COMPANY • CHICAGO



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# USG BUILT-UP ROOFING

## THE POSITION OF THE UNITED STATES GYPSUM COMPANY IN THE BUILT-UP ROOFING INDUSTRY

The unique position of the United States Gypsum Company in the building industry makes particularly significant its position in the field of built-up roofing. FIRST, USG makes most of the principal types of roof decks—Poured Gypsum, Gypsum Tile, and Steel. SECOND, USG is a large manufacturer of thermal insulation. THIRD, USG operates its own factories for the manufacture of roofing products.

The result of these co-ordinated facilities is that the United States Gypsum Company can furnish materials for the complete installation of roof decks, roof deck insulation, and many types of roof coverings.

USG Built-up Roofing as described in the following pages is adaptable for use over all types of structures which are covered with built-up roofing.

Built-up Roof Bonds of two types are offered—a twenty-year bond and a ten-year bond. Inspection service is a part of each. Unbonded roofs, identical in all respects to the bonded roofs save for inspection and the Guaranty Bond, may be purchased with resultant economy.

The quality of USG Roofing Products parallels that of the long list of time-tested USG Building Products which have for more than 30 years received the approval of discriminating users.

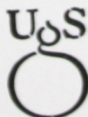
### SALES OFFICES

Atlanta, Ga....1440 Citizens and Southern Bank Bldg.  
Boston, Mass.....Mystic Wharf, Charlestown (Plant)  
Buffalo, N. Y.....514 Brisbane Building  
Chicago, Ill.....300 West Adams St.  
Cincinnati, Ohio.....506 Builders' Building  
Cleveland, Ohio.....817 Hanna Building  
Dallas, Tex.....1302 Santa Fe Building  
Denver, Colo.....Continental Oil Building  
Detroit, Mich.....River Rouge (Plant)  
Indianapolis, Ind....Architects' and Builders' Building  
Kansas City Mo.....505-6-7 Fairfax Building  
Los Angeles, Calif.  
507 Architects Building, 5th Street at Figueroa  
Milwaukee, Wis.....439 W. Oregon Street (Plant)  
Minneapolis, Minn.....2510 Foshay Tower  
New York City, N. Y.....30 Rockefeller Plaza  
Omaha, Neb.....Woodmen of the World Building  
Philadelphia, Pa....58th and Schuylkill River (Plant)  
Pittsburgh, Pa.....1205 Law and Finance Building  
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San Francisco, Calif.....2501 Harrison Street  
Washington, D. C.  
Investment Building, 15th and K Streets, N. W.

### MILLS, MINES, AND WAREHOUSES

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Cleveland, Ohio  
Cordova, Ill.  
Detroit, Mich.  
East Chicago, Ind.  
Eldorado, Okla.  
Falls Village, Conn.  
Farnams, Mass.  
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Genoa, Ohio  
Grand Rapids, Mich.  
Greenville, Miss.  
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Midland, Calif.  
Milwaukee, Wis.  
New Braunfels, Tex.  
New Brighton, S. I., N. Y.  
North Kansas City, Mo.  
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Oakfield, N. Y.  
Philadelphia, Pa.  
Piedmont, S. D.  
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St. Paul, Minn.  
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Skaneateles Falls, N. Y.  
Southard, Okla.  
South Bend, Ind.  
South Gate (Los Angeles), Calif.  
Sweetwater, Tex.  
Warren, Ohio

Samson Plaster Board Company  
Sales Agents, United States Gypsum Company  
Crosby Building, Buffalo, N. Y.



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1936 EDITION







# United States Gypsum Co. Built-up Roofing Specifications

Specification Number		Term of Years	Underwriters' Classification	Limitation of Roof Deck Incline in Inches per Foot	TYPE OF ROOF DECK							TYPE OF MATERIAL										LOCATION	Page Number	
					Wood	Precast Gypsum	Poured Concrete	Poured Gypsum	Precast Concrete	Book Tile	Steel	Insulation	Number of Piles of Felt		Bitumen (Coal Tar Pitch or Asphalt)	Weight of Material Per 100 Square Feet						Surface Finish	Approved for Applications in Sections of United States as Shown	
																15 lb. Felt	Base Sheet	Cap Sheet	Coal Tar Pitch	Asphalt	Primer			
A	20	A	A	0 to 2	•	•							5—15 lb.	Pitch		75		150				Gravel or Slag	All Sections	5
1	20	A	A	0 to 2	•	•							5—15 lb.	Asphalt		75				125		Gravel or Slag	All Sections	6
2	20	A	A	0 to 2		•	•		•	•	•	•	4—15 lb.	Pitch		60		200				Gravel or Slag	All Sections	7
3	20	A	A	0 to 2		•	•		•	•	•	•	4—15 lb.	Asphalt		60				150		Gravel or Slag	All Sections	8
A	10	A	A	0 to 2	•	•							4—15 lb.	Pitch		60						Gravel or Slag	All Sections	9
3	10	A	A	0 to 2	•	•							4—15 lb.	Asphalt		60				100		Gravel or Slag	All Sections	10
A	10	A	A	0 to 2					•	•	•	•	3—15 lb.	Pitch		45		175				Gravel or Slag	All Sections	11
4	10	A	A	0 to 2					•	•	•	•	3—15 lb.	Asphalt		45						Gravel or Slag	All Sections	12
5	20	C	C	2 to 6	•	•							1—60 lb. 3—15 lb.	Asphalt		45	60			100	Asphalt	Northern	13	
6	20	C	C	2 to 6		•			•	•	•	•	3—15 lb. 2—34 lb.	Asphalt		45		68		125	10	Sanded	All Sections	15
7	10	C	C	2 to 6	•	•							1—45 lb. 2—15 lb.	Asphalt		30	45			75		Asphalt	Northern	17
8	10	C	C	2 to 6		•			•	•	•	•	2—15 lb. 2—34 lb.	Asphalt		30		68		100	10	Sanded	All Sections	19
9	20	C	C	1 to 6	•	•			•	•			3—15 lb. 1—85 lb.	Asphalt		45		85		75		Mineral	All Sections	21
10	20	C	C	1 to 6		•			•	•	•	•	3—15 lb. 1—85 lb.	Asphalt		45		85		105	10	Mineral	All Sections	23
11	10	C	C	1 to 6	•	•							2—15 lb. 1—85 lb.	Asphalt		30		85		50		Mineral	All Sections	25
12	10	C	C	1 to 6					•	•	•	•	2—15 lb. 1—85 lb.	Asphalt		30		85		80	10	Mineral	All Sections	27

## USG WEATHERWOOD ROOF DECK INSULATION

Introduction—Correlative Provisions—General Requirements—Materials and Application	Pages 29 to 32
Specification No. 100—Over Wood Roof Decks Where High Humidities Are Not a Factor	Page 33
Specification No. 200—Over Wood Roof Decks Where High Humidities Are a Factor	Page 33
Specification No. 300—Over Gypsum and Concrete Decks	Page 34
Specification No. 400—Over Steel Roof Decks	Page 35
Prevention of Condensation	Pages 36, 37

## USG BUILT-UP ROOF FLASHINGS

Introduction—Correlative Provisions—General Requirements—Materials and Application	Pages 38 to 40
Specification No. 20F —USG 20-Year Bonded Fabric Counter-Flashing	Page 40
Specification No. 10F —USG 10-Year Bonded Fabric Counter-Flashing	Page 41
Specification No. 20M —USG Metal Base and Cap-Flashing	Page 41
Specification No. 10FM—USG Felt Roofing Base and Metal Cap-Flashing	Page 41
Details of Various Types of Flashings	Pages 42 to 45



# USG CORRELATIVE PROVISIONS

## PREPARATION AND OTHER REQUIREMENTS OF ROOF DECKS TO RECEIVE USG STANDARD BUILT-UP ROOFING

**NOTE**—Construction of roof decks and provision for satisfactory surfaces to receive the roofing are not a part of the Roofing Contractor's work and are therefore not included in the individual USG Roofing Specifications. The following provisions, however, should be included as they apply under the proper headings of the specifications to be executed by others.

### PARAPETS AND SIMILAR VERTICAL WALLS

Parapet and similar vertical walls surrounding the roof areas should be so constructed as to prevent infiltration of moisture to the interior of the walls above the line of roof flashing. For recommendations, see page 38.

### ROOF DECK PROVISIONS

#### GENERAL

**Drainage**—Roof decks shall be accurately graded to drainage connections which shall be provided to assure the free flow of water from all points of the roof surface.

Gypsum fill to make drainage slopes above the roof deck is preferable to cinder aggregate fill which tends to expand excessively and crack.

The size and location of the drainage connections should depend upon the rate of rainfall in the locality of the roof. It is estimated that the maximum rate of rainfall in the United States varies from 4.5 to 8.5 inches per hour. For all practical purposes, provision for the handling of 6.5 inches of rainfall per hour may be used as a guide.

An accepted rule is to provide one square inch of leader (drain pipe) area for every 150 square feet of roof surface. Leaders should be spaced not more than 50 feet apart for pitched roofs and not more than 75 feet apart for flat roofs.

Lower roofs must be protected against abrasion and damage from water streams shed from open valleys or gutters of upper roofs by installing metal spreaders to distribute the flow of water.

**Expansion Joints**—Proper expansion joints shall be provided on large roof areas to eliminate excessive contraction and expansion.

#### WOOD DECKS

Decks shall be constructed of splined or matched tongue and groove well seasoned or treated lumber not less than 13/16 in. in thickness.

Purlin and rafter spacing shall be such as to prevent noticeable deflection under ordinary loads. Snow loads shall be provided for where needed.

Boards shall be dry, smooth, and free from wide cracks or large knot holes and shall be laid close together. They shall have solid bearings at ends (unless end matched) and shall be securely nailed to each bearing with not less than two face nails with heads driven flush with the surface of the boards.

All cracks wider than 1/4 inch and all knot holes larger than 1/4 inch in diameter shall be covered with tin or other suitable metal substantially nailed in place. End joints wider than 1/4 inch shall be likewise covered.

#### POURED GYPSUM OR CONCRETE DECKS

The poured gypsum (such as USG Sheetrock Pyrofill Roof Construction) or poured concrete roof deck surfaces shall be dry, smooth, firm, and thoroughly set, free from frost and projections above or depressions in the plane of the roof deck surface.

The roof deck shall be free from loose sand, scale resulting from frozen mix, and all loose material.

All irregularities in the surface of the deck shall be satisfactorily corrected by the removal of high spots and the filling in of low spots with gypsum or cement mortar properly bonded to the deck surface. All sharp arrises shall be rounded.

Unless the character of the concrete will permit nailing, provision shall be made for anchoring the roofing material at ridges, eaves, and gables by embedding treated wood nailing strips in the concrete level with the surface or attached to the structural steel.

On concrete decks, when the incline of the roof deck exceeds 3 inches in 12 inches, provision shall be made to enable the Roofing Contractor to securely anchor the roofing materials. Embed treated wood nailing strips in the roof deck parallel with the roof pitch not to exceed 4 feet apart on centers.



## PRECAST GYPSUM OR CONCRETE SLAB DECKS

Tile (such as USG Pyrobar Precast Gypsum Tile) or precast concrete slabs shall be accurately laid upon the supporting steel work.

Bearings shall be even and full and the units laid tight. All joints on the deck surface shall be pointed full with gypsum mortar or plastic cement, struck smooth. All roof surfaces shall be smooth and true ready to receive the roofing materials.

On concrete decks, suitable nailing strips embedded in or securely fastened to the units or to the structural steel flush with the surface shall be provided at ridges, eaves, gables, and crests to provide secure fastening for roofing materials, gravel stops, flashings, and metal fascias.

On concrete decks when the incline of the roof deck exceeds 3 inches in 12 inches, provision shall be made to enable the Roofing Contractor to securely anchor the roofing materials. Embed treated wood nailing strips in the roof deck parallel with the roof pitch not to exceed 4 feet apart on centers.

## BOOK TILE DECKS

Book tile and similar surfaces shall be covered with not less than a 1 inch thickness of Gypsum or Portland cement mortar finished smooth, firm, and properly bonded to the underlying tile.

## CANT STRIPS

**General**—Cant strips shall be provided at all intersections of roof surfaces with vertical walls, parapets, and curbs. The cant shall be not less than 3½ inches in height and shall extend out not less than 3½ inches on the roof surface.

**On Wood Decks**—The cant strip may be constructed of beveled lumber not less than one (1) inch thick se-

Other requirements applying to poured gypsum or concrete decks shall apply in like manner here.

## STEEL DECKS

Steel decks (such as USG Steel Roof Deck) shall be in accordance with the manufacturer's standard designs with allowable safe loads based on actual tests on bare plates.

The deck shall be free from perforations which will allow hot bitumen to drip through and shall be free from bolt heads or similar projections above the roof surface other than the attachment clips and accessories required to attach the deck to the purlins.

Decks and fittings, unless galvanized, must be painted with a shop coat of paint to assure a satisfactory bonding surface for the roofing materials. If surfaces are not properly painted at the time of erection, they shall be painted by the steel erection contractor to the Roofing Contractor's satisfaction prior to the application of the roofing materials.

At least one layer of ½ inch approved roof insulation (such as USG Weatherwood Roof Insulation) shall be applied to the steel deck before the application of the roofing materials will be permitted. Insulation shall be applied in strict accordance with Insulation Specifications, pages 30 to 35 inclusive. Proper devices for fastening the roof insulation shall be provided by the steel deck manufacturer where the roof deck incline exceeds 3 inches in 12 inches.

cured to 2 inch triangular blocks nailed to the roof deck approximately 16 inches on centers. A diagonal half 4 in. x 4 in. set in the angle and securely toe nailed at the lower edge is acceptable and recommended.

**On Incombustible Decks**—A gypsum mortar or concrete cant properly bonded to the roof deck shall be installed on gypsum or concrete decks.

**USG Metal Cant Strip**—A 20 gauge galvanized or painted metal cant strip made particularly for use with USG Steel Roof Decks may be used to advantage on all other types of decks. See details, page 45.

## FLASHING RAGGLES

**General**—Unless otherwise specified, flashing raggles shall be provided in all vertical walls, parapets, and curbs. They shall be uniformly ½ inch wide by 1½ inch deep free from mortar or projections of any kind. They shall be set not less than five (5) inches nor more than eight and one-half (8½) inches above the top of the roof deck either parallel with the top of the cant strip or stepped to follow the roof incline or slope depending on the wall material. Where stepped, overlap at ends at least 3 inches.

**Raggles and Nailing Strips in Concrete Walls**—Pro-

vide a chamfered removable wood strip ½ inch wide by 1½ inches deep nailed to the forms parallel with the roof incline or slope.

At a point one (1) inch below the raggles provide a permanent, chamfered wood nailing strip 1 inch wide by 1½ inches deep, likewise nailed in the forms.

Raggles shall be removed with forms. Nailing strip shall remain in completed wall.

**Raggles in Brick Walls**—During construction lay in a removable chamfered wood strip ½ inch thick by 1½ inches deep, stepped to follow the roof inclines.



# USG 20-YEAR BONDED BUILT-UP ROOF . . . *Specification No. 1*

## 5-PLY GRAVEL OR SLAG SURFACED ROOFING OVER WOOD OR PRECAST GYPSUM TILE DECKS

The Roofing Contractor shall examine all surfaces upon or against which roofing is to be applied. He shall determine that the roof deck is properly prepared, slopes to drains are properly constructed, the roof deck is thoroughly dry, smooth, and free from projections above or depressions in the plane of the deck surface, the deck is free from rubbish and debris and ready to receive the roofing materials. He shall notify the Architect of any defects he considers detrimental to the installation of the roofing materials and shall make sure that all defects are corrected before he begins work. The application of roofing materials by the Roofing Contractor will be considered acceptance by him of the roof deck as constructed.

## GENERAL REQUIREMENTS APPLYING to SPECIFICATIONS 1-A and 1-B

- Approved for application throughout the United States on roof decks where the incline does not exceed two (2) inches in twelve (12) inches.
- These roofs are listed by the Underwriters' Laboratories as Class A.
- Preparation and other Requirements applying to Wood and Precast Gypsum Tile Decks shall be in accordance with "Correlative Provisions," page 3 which are a part of these detailed specifications.
- For USG Built-up Bonded Roof Flashings, see pages 38 to 45 inclusive.

**BOND**—The Roofing Contractor shall furnish a United States Gypsum Co. Twenty (20)-Year

Guaranty Bond issued by the National Surety Co.

**NOTE**—*The United States Gypsum Company will furnish its 20-Year Guaranty Bond on all roofs of 5000 square feet or more in the United States where its inspection service is available. The roof must be applied by a Roofing Contractor approved by the United States Gypsum Company in strict accordance with its Bonded Roof Specifications and subject to United States Gypsum Company inspection, acceptance, and approval.*

## MATERIALS AND APPLICATION

Simplex flat head roofing nails or galvanized roofing nails driven through flat tin discs shall be used to nail the roofing to the deck. Nails shall be 7/8 in. long for wood decks and 1 1/4 in. long for gypsum decks.

Temperature of USG Coal Tar Pitch or Asphalt shall never exceed 400° F. in heating kettle.

Surfacing material (Gravel or Slag) shall be dry, free from sand or dirt, and graduated in size from one-

quarter (1/4) inch to five-eighths (5/8) inch in diameter. During cold weather Gravel or Slag shall be heated immediately preceding application to eliminate moisture.

Application of all felts shall start at low points and be laid at right angle to slope of roof. All end laps shall be not less than six (6) inches.

All felts shall be 32 inches wide and shall be laid without wrinkles or buckles.

## SPECIFICATION USG 1-A (TAR SATURATED FELT and COAL TAR PITCH)

Five plies of USG Tar Saturated Rag Felt, each ply weighing 15 lbs. per 100 sq. ft., and not less than 150 lbs. of USG Coal Tar Pitch, and 400 lbs. of Gravel or 300 lbs. of Slag shall be used to construct 100 sq. ft. of USG Bonded Built-up Roofing 1-A.

**FIRST**—Cover the roof deck with a layer of Red Rosin Sized Sheathing Paper weighing not less than five (5) pounds per one hundred (100) square feet. Lap paper two (2) inches and secure to deck by occasional nailing.

**SECOND**—Apply two (2) plies of USG Tar Saturated Rag Felt weighing fifteen (15) pounds per one hundred (100) square feet, single thickness, lapping each sheet seventeen (17) inches over the preceding sheet, and extending up to the top of the cant strip or on all vertical surfaces four (4) inches. Nail as required to hold the sheets in place until remaining felt is laid.

**THIRD**—Coat the entire surface of the felts thus laid with USG Coal Tar Pitch.



**FOURTH**—Apply three (3) plies of USG Tar Saturated Rag Felt weighing fifteen (15) pounds per one hundred (100) square feet, single thickness, lapping each sheet twenty-two (22) inches over the preceding sheet and extending up to the top of the cant strip or on all vertical surfaces four (4) inches. (When the incline of roof exceeds 1" in 12", each sheet shall be nailed every 18" not lower than 3" from the top edge of the sheet. All nails shall be covered with not less than two plies of felt.) A uniform coat of USG Coal Tar Pitch shall be

applied to the full twenty-two (22) inch lap so that at no point shall felt touch felt.

**FIFTH**—Cover the entire roof surface with a uniform, heavy coat of USG Coal Tar Pitch poured from a dipper or suitable pouring can, using not less than sixty (60) pounds of pitch to cover one hundred (100) square feet of roof surface. Into this flood coat, while hot, a complete covering of Gravel or Slag shall be thoroughly and uniformly embedded.

### SPECIFICATION USG 1-B (ASPHALT SATURATED FELT AND ASPHALT)

Five plies of USG Asphalt Saturated Rag Felt, each ply weighing 15 lbs. per 100 sq. ft., and not less than 125 lbs. of USG **Flat** Asphalt, and 400 lbs. of Gravel or 300 lbs. of Slag shall be used to construct 100 sq. ft. of USG Bonded Built-up Roofing 1-B.

**FIRST**—The roof deck shall be covered with a layer of Red Rosin Sized Sheathing Paper weighing not less than five (5) pounds per one hundred (100) square feet. Paper shall be lapped two (2) inches and secured to the deck by occasional nailing.

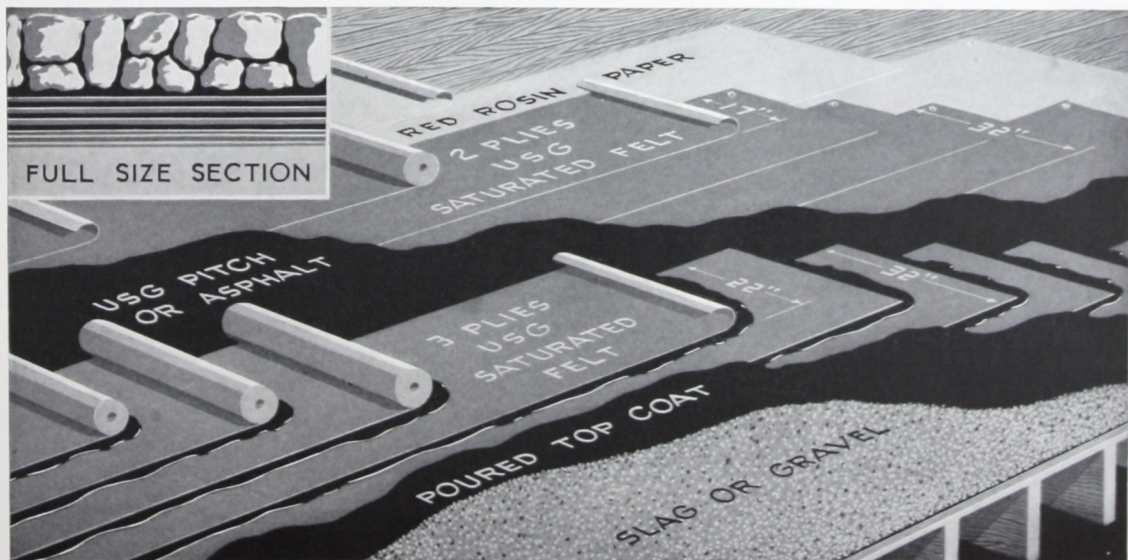
**SECOND**—Apply two (2) plies of USG Asphalt Saturated Rag Felt weighing fifteen (15) pounds per one hundred (100) square feet, single thickness, lapping each sheet seventeen (17) inches over the preceding sheet and extending up to the top of the cant strip or on all vertical surfaces four (4) inches. Nail as required to hold sheets in place until remaining felt is laid.

**THIRD**—Mop the surface of the felts thus laid with USG Asphalt, into which, while hot, shall be embedded three (3) plies of USG Asphalt Saturated Rag Felt

weighing fifteen (15) pounds per one hundred (100) square feet, single thickness, lapping each sheet twenty-two (22) inches over preceding sheet and extending up to the top of the cant strip or on all vertical surfaces four (4) inches. Roll each sheet immediately behind the mop to assure a solid mopping of asphalt so that at no point shall felt touch felt. There shall be not less than twenty-five (25) pounds of asphalt used per one hundred (100) square feet in the individual moppings under and between plies of felt (75 pounds total). (When the incline of roof exceeds 1" in 12", each sheet shall be nailed every 18" not lower than 3" from the top edge of the sheet. All nails shall be covered by not less than two plies of felt.)

**FOURTH**—Cover the entire roof surface with a uniform, heavy coat of USG Asphalt poured from a dipper or suitable pouring can, using not less than fifty (50) pounds of Asphalt to cover one hundred (100) square feet of roof surface. Into this top coating, while hot, a complete covering of Gravel or Slag shall be thoroughly and uniformly embedded.

#### DETAIL OF CONSTRUCTION FOR BUILT-UP ROOF SPECIFICATIONS 1-A AND 1-B





# USG 20-YEAR BONDED BUILT-UP ROOF . . . *Specification No. 2*

## 4-PLY GRAVEL OR SLAG SURFACED ROOFING OVER POURED GYPSUM OR CONCRETE, PRECAST CONCRETE SLAB DECKS

The Roofing Contractor shall examine all surfaces upon or against which roofing is to be applied. He shall determine that the roof deck is properly prepared, slopes to drains are properly constructed, the roof deck is thoroughly dry, smooth, and free from projections above or depressions in the plane of the deck surface, the deck is free from rubbish and debris and ready to receive the roofing materials. He shall notify the Architect of any defects he considers detrimental to the installation of the roofing materials and shall make sure that all defects are corrected before he begins work. The application of roofing materials by the Roofing Contractor will be considered acceptance by him of the roof deck as constructed.

## GENERAL REQUIREMENTS APPLYING to SPECIFICATIONS 2-A and 2-B

- Approved for application throughout the United States on roof decks where the incline does not exceed 2 inches in 12 inches.
- Roofs are listed by Underwriters' Laboratories as Class A.
- Preparation and other Requirements applying to these particular types of decks shall be in accordance with "Correlative Provisions," page 3 which are a part of these detailed specifications.
- For USG Built-up Bonded Flashings, see pages 38 to 45 inclusive.

**BOND**—The Roofing Contractor shall furnish a United States Gypsum Co. Twenty (20)-Year

Guaranty Bond issued by the National Surety Co.

**NOTE**—The United States Gypsum Company will furnish its 20-Year Guaranty Bond on all roofs of 5000 square feet or more in the United States where its inspection service is available. The roof must be applied by a Roofing Contractor approved by the United States Gypsum Company in strict accordance with its Bonded Roof Specifications and subject to United States Gypsum Company inspection, acceptance, and approval.

## MATERIALS AND APPLICATION

Temperature of USG Coal Tar Pitch or Asphalt shall never exceed 400° F. in heating kettle.

The surfacing material (Gravel or Slag) shall be dry, free from sand or dirt, and graduated in size from one-quarter (¼) inch to five-eighths (⅝) inch in diameter. During cold weather Gravel or Slag shall be heated im-

mediately preceding application to eliminate moisture.

Application of all felts shall start at low points and be laid at right angle to slope of roof. All end laps shall be not less than six (6) inches.

All felts shall be 32 inches wide and shall be laid without wrinkles or buckles.

## SPECIFICATION USG 2-A (TAR SATURATED FELT and COAL TAR PITCH)

Four plies of USG Tar Saturated Rag Felt, each ply weighing 15 lbs. per 100 sq. ft., and not less than 200 lbs. of USG Coal Tar Pitch, and 400 lbs. of Gravel or 300 lbs. of Slag shall be used to construct 100 sq. ft. of USG Bonded Built-up Roofing 2-A.

**FIRST**—Coat the entire deck surface with USG Coal Tar Pitch.

**NOTE**—If Precast Concrete Slabs are used, strip mop each slab, staying back three (3) inches from all joints.

**SECOND**—Apply four (4) plies of USG Tar Saturated Rag Felt weighing fifteen (15) pounds per one hundred (100) square feet, single thickness, lapping each sheet

twenty-four and one-half (24½) inches over preceding sheet, cutting the felt off at the top of the cant strip or on all vertical surfaces four (4) inches. Apply a uniform coat of USG Coal Tar Pitch to the full twenty-four and one-half (24½) inch lap so that at no point shall felt touch felt.

**THIRD**—Cover the entire roof surface with a uniform, heavy coat of USG Coal Tar Pitch poured from a dipper or suitable pouring can, using not less than sixty (60) pounds of pitch to cover one hundred (100) square feet of roof surface. Into this flood coat, while hot, a complete covering of Gravel or Slag shall be thoroughly and uniformly embedded.



**SPECIFICATION USG 2-B**  
(ASPHALT SATURATED FELT AND ASPHALT)

Four plies of USG Asphalt Saturated Rag Felt, each ply weighing 15 lbs. per 100 sq. ft., and not less than 150 lbs. of USG **Flat** Asphalt, and 400 lbs. of Gravel or 300 lbs. of Slag shall be used to construct 100 sq. ft. of USG Built-up Roofing No. 2-B.

**FIRST**—Mop the entire surface of the deck with USG Asphalt.

**NOTE**—If Precast Concrete Slabs are used, strip mop each slab, staying back three (3) inches from all joints.

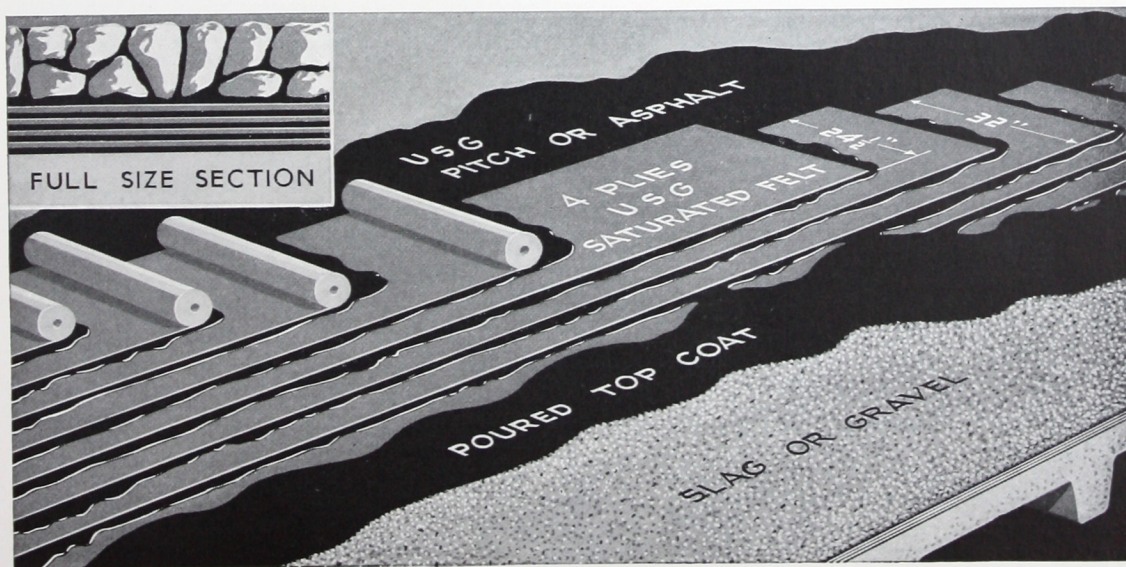
**SECOND**—Into this mopping, while hot, shall be embedded four (4) plies of USG Asphalt Saturated Rag Felt weighing fifteen (15) pounds per one hundred (100) square feet, single thickness, lapping each sheet

twenty-four and one-half (24½) inches over preceding sheet, cutting the felt off at the top of the cant strip or on all vertical surfaces four (4) inches. Roll each sheet immediately behind the mop to assure a solid mopping of asphalt so that at no point shall felt touch felt. There shall be not less than twenty-five (25) pounds of asphalt used per one hundred (100) square feet in the individual moppings under and between plies of felt (100 pounds total).

**THIRD**—Cover the entire roof surface with a uniform, heavy coat of USG Asphalt poured from a dipper or suitable pouring can, using not less than fifty (50) pounds of asphalt to cover one hundred (100) square feet of roof surface. Into this top coating, while hot, a complete covering of Gravel or Slag shall be thoroughly and uniformly embedded.



DETAIL OF CONSTRUCTION FOR BUILT-UP ROOF SPECIFICATIONS 2-A AND 2-B





# USG 10-YEAR BONDED BUILT-UP ROOF . . . *Specification No. 3*

## 4-PLY GRAVEL OR SLAG SURFACED ROOFING OVER WOOD OR PRECAST GYPSUM TILE DECKS

- Approved for application throughout the United States on roof decks where the incline does not exceed two (2) inches in twelve (12) inches.
- These roofs are listed by the Underwriters' Laboratories as Class A.
- Preparation and other Requirements applying to Wood and Precast Gypsum Tile Decks shall be in accordance with "Correlative Provisions," page 3 which are a part of these detailed specifications.
- For USG Built-up Bonded Roof Flashings, see pages 38 to 45 inclusive.

The Roofing Contractor shall examine all surfaces upon or against which roofing is to be applied. He shall determine that the roof deck is properly prepared, slopes to drains are properly constructed, the roof deck is thoroughly dry, smooth, and free from projections above or depressions in the plane of the deck surface, the deck is free from rubbish and debris and ready to receive the roofing materials. He shall notify the Architect of any defects he considers detrimental to the installation of the roofing materials and shall make sure that all defects are corrected before he begins work. The application of roofing materials by the Roofing Contractor will be considered acceptance by him of the roof deck as constructed.

## GENERAL REQUIREMENTS APPLYING to SPECIFICATIONS 3-A and 3-B

**BOND**—The Roofing Contractor shall furnish a United States Gypsum Co. Ten (10)-Year Guar-

anty Bond issued by the National Surety Co.

. . .

**NOTE**—The United States Gypsum Company will furnish its 10-Year Guaranty Bond on all roofs of 2500 square feet or more in the United States where its inspection service is available. The roof must be applied by a Roofing Contractor approved by the United States Gypsum Company in strict accordance with its Bonded Roof Specifications and subject to United States Gypsum Company inspection, acceptance, and approval.

## MATERIALS AND APPLICATION

Simplex flat head roofing nails or galvanized roofing nails driven through flat tin discs shall be used to nail the roofing to the deck. Nails shall be  $\frac{7}{8}$  in. long for wood decks and  $1\frac{1}{4}$  in. long for gypsum decks.

Temperature of USG Coal Tar Pitch or Asphalt shall never exceed 400° F. in heating kettle.

Surfacing material (Gravel or Slag) shall be dry, free from sand or dirt, and graduated in size from one-

quarter ( $\frac{1}{4}$ ) inch to five-eighths ( $\frac{5}{8}$ ) inch in diameter. During cold weather Gravel or Slag shall be heated immediately preceding application to eliminate moisture.

Application of all felts shall start at low points and be laid at right angle to slope of roof. All end laps shall be not less than six (6) inches.

All felts shall be 32 inches wide and shall be laid without wrinkles or buckles.

## SPECIFICATION USG 3-A (TAR SATURATED FELT and COAL TAR PITCH)

Four plies of USG Tar Saturated Rag Felt, each ply weighing 15 lbs. per 100 sq. ft., and not less than 125 lbs. of USG Coal Tar Pitch, and 400 lbs. of Gravel or 300 lbs. of Slag shall be used to construct 100 sq. ft. of USG Bonded Built-up Roofing 3-A.

**FIRST**—Cover the roof deck with a layer of Red Rosin Sized Sheathing Paper weighing not less than five (5) pounds per one hundred (100) square feet. Lap paper two (2) inches and secure to deck by occasional nailing.

**SECOND**—Apply two (2) plies of USG Tar Saturated Rag Felt weighing fifteen (15) pounds per one hundred (100) square feet, single thickness, lapping each sheet seventeen (17) inches over the preceding sheet, and extending up to the top of the cant strip or on all vertical surfaces four (4) inches. Nail as required to hold the sheets in place until remaining felt is laid.

**THIRD**—Coat the entire surface of the felts thus laid with USG Coal Tar Pitch.



**FOURTH**—Apply two (2) plies of USG Tar Saturated Rag Felt weighing fifteen (15) pounds per one hundred (100) square feet, single thickness, lapping each sheet seventeen (17) inches over the preceding sheet and extending up to the top of the cant strip or on all vertical surfaces four (4) inches. (When the incline of roof exceeds 1" in 12", each sheet shall be nailed every 18" not lower than 3" from the top edge of the sheet. All nails shall be covered with one ply of felt.) A uniform coat of USG Coal Tar Pitch shall be applied to the full

seventeen (17) inch lap so that at no point shall felt touch felt.

**FIFTH**—Cover the entire roof surface with a uniform, heavy coat of USG Coal Tar Pitch poured from a dipper or suitable pouring can, using not less than sixty (60) pounds of pitch to cover one hundred (100) square feet of roof surface. Into this flood coat, while hot, a complete covering of Gravel or Slag shall be thoroughly and uniformly embedded.

### SPECIFICATION USG 3-B (ASPHALT SATURATED FELT AND ASPHALT)

Four plies of USG Asphalt Saturated Rag Felt, each ply weighing 15 lbs. per 100 sq. ft., and not less than 100 lbs. of USG Flat Asphalt, and 400 lbs. of Gravel or 300 lbs. of Slag shall be used to construct 100 sq. ft. of USG Bonded Built-up Roofing 3-B.

**FIRST**—The roof deck shall be covered with a layer of Red Rosin Sized Sheathing Paper weighing not less than five (5) pounds per one hundred (100) square feet. Paper shall be lapped two (2) inches and secured to the deck by occasional nailing.

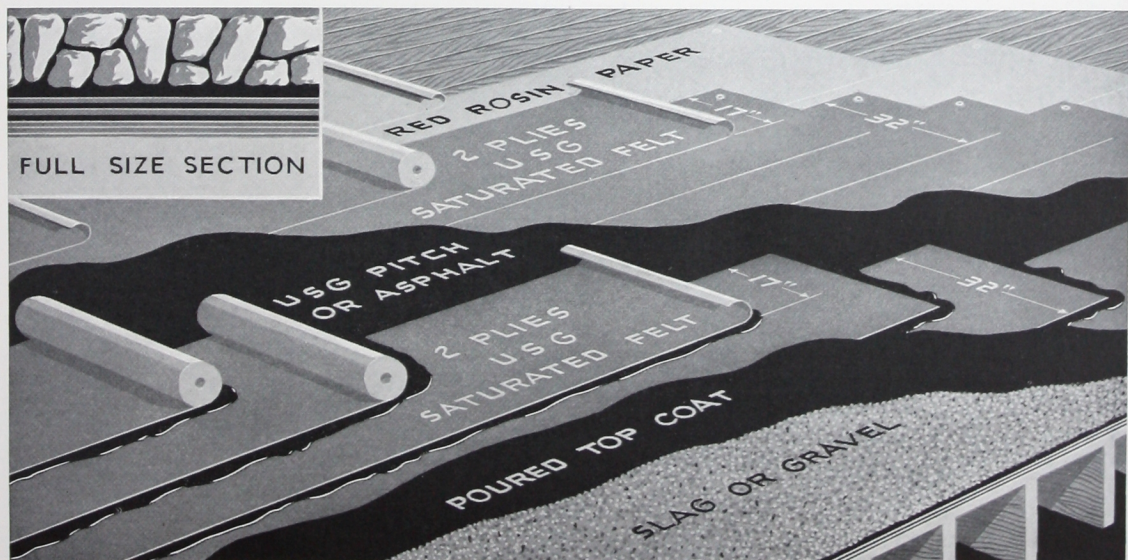
**SECOND**—Apply two (2) plies of USG Asphalt Saturated Rag Felt weighing fifteen (15) pounds per one hundred (100) square feet, single thickness, lapping each sheet seventeen (17) inches over the preceding sheet and extending up to the top of the cant strip or on all vertical surfaces four (4) inches. Nail as required to hold sheets in place until remaining felt is laid.

**THIRD**—Mop the surface of the felts thus laid with USG Asphalt, into which, while hot, shall be embedded two (2) plies of USG Asphalt Saturated Rag Felt

weighing fifteen (15) pounds per one hundred (100) square feet, single thickness, lapping each sheet seventeen (17) inches over preceding sheet and extending up to the top of the cant strip or on all vertical surfaces four (4) inches. Roll each sheet immediately behind the mop to assure a solid mopping of asphalt so that at no point shall felt touch felt. There shall be not less than twenty-five (25) pounds of asphalt used per one hundred (100) square feet in the individual moppings under and between plies of felt (50 pounds total). (When the incline of roof exceeds 1" in 12", each sheet shall be nailed every 18" not lower than 3" from the top edge of the sheet. All nails shall be covered with one ply of felt.)

**FOURTH**—Cover the entire roof surface with a uniform, heavy coat of USG Asphalt poured from a dipper or suitable pouring can, using not less than fifty (50) pounds of Asphalt to cover one hundred (100) square feet of roof surface. Into this top coating, while hot, a complete covering of Gravel or Slag shall be thoroughly and uniformly embedded.

#### DETAIL OF CONSTRUCTION FOR BUILT-UP ROOF SPECIFICATIONS 3-A AND 3-B





# USG 10-YEAR BONDED BUILT-UP ROOF . . . *Specification No. 4*

## 3-PLY GRAVEL OR SLAG SURFACED ROOFING OVER POURED GYPSUM OR CONCRETE, PRECAST CONCRETE SLAB DECKS

- Approved for application throughout the United States on roof decks where the incline does not exceed 2 inches in 12 inches.
- Roofs are listed by Underwriters' Laboratories as Class A.
- Preparation and other Requirements applying to these particular types of decks shall be in accordance with "Correlative Provisions," page 3 which are a part of these detailed specifications.
- For USG Built-up Bonded Flashings, see pages 38 to 45 inclusive.

The Roofing Contractor shall examine all surfaces upon or against which roofing is to be applied. He shall determine that the roof deck is properly prepared, slopes to drains are properly constructed, the roof deck is thoroughly dry, smooth, and free from projections above or depressions in the plane of the deck surface, the deck is free from rubbish and debris and ready to receive the roofing materials. He shall notify the Architect of any defects he considers detrimental to the installation of the roofing materials and shall make sure that all defects are corrected before he begins work. The application of roofing materials by the Roofing Contractor will be considered acceptance by him of the roof deck as constructed.

## GENERAL REQUIREMENTS APPLYING to SPECIFICATIONS 4-A and 4-B

**BOND**—The Roofing Contractor shall furnish a United States Gypsum Co. Ten (10)-Year Guar-

anty Bond issued by the National Surety Co.

**NOTE**—*The United States Gypsum Company will furnish its 10-Year Guaranty Bond on all roofs of 2500 square feet or more in the United States where its inspection service is available. The roof must be applied by a Roofing Contractor approved by the United States Gypsum Company in strict accordance with its Bonded Roof Specifications and subject to United States Gypsum Company inspection, acceptance, and approval.*

## MATERIALS AND APPLICATION

Temperature of USG Coal Tar Pitch or Asphalt shall never exceed 400° F. in heating kettle.

The surfacing material (Gravel or Slag) shall be dry, free from sand or dirt, and graduated in size from one-quarter (1/4) inch to five-eighths (5/8) inch in diameter. During cold weather Gravel or Slag shall be heated im-

mediately preceding application to eliminate moisture.

Application of all felts shall start at low points and be laid at right angle to slope of roof. All end laps shall be not less than six (6) inches.

All felts shall be 32 inches wide and shall be laid without wrinkles or buckles.

## SPECIFICATION USG 4-A (TAR SATURATED FELT and COAL TAR PITCH)

Three plies of USG Tar Saturated Rag Felt, each ply weighing 15 lbs. per 100 sq. ft., and not less than 175 lbs. of USG Coal Tar Pitch, and 400 lbs. of Gravel or 300 lbs. of Slag shall be used to construct 100 sq. ft. of USG Bonded Built-up Roofing 4-A.

**FIRST**—Coat the entire deck surface with USG Coal Tar Pitch.

**NOTE**—*If Precast Concrete Slabs are used, strip mop each slab, staying back three (3) inches from all joints.*

**SECOND**—Apply three (3) plies of USG Tar Saturated Rag Felt weighing fifteen (15) pounds per one hundred

(100) square feet, single thickness, lapping each sheet twenty-two (22) inches over preceding sheet, cutting the felt off at the top of the cant strip or on all vertical surfaces four (4) inches. Apply a uniform coat of USG Coal Tar Pitch to the full twenty-two (22) inch lap so that at no point shall felt touch felt.

**THIRD**—Cover the entire roof surface with a uniform, heavy coat of USG Coal Tar Pitch poured from a dipper or suitable pouring can, using not less than sixty (60) pounds of pitch to cover one hundred (100) square feet of roof surface. Into this flood coat, while hot, a complete covering of Gravel or Slag shall be thoroughly and uniformly embedded.



# **SPECIFICATION USG 4-B** (ASPHALT SATURATED FELT and ASPHALT)

Three plies of USG Asphalt Saturated Rag Felt, each ply weighing 15 lbs. per 100 sq. ft., and not less than 125 lbs. of USG **Flat** Asphalt, and 400 lbs. of Gravel or 300 lbs. of Slag shall be used to construct 100 sq. ft. of USG Bonded Built-up Roofing 4-B.

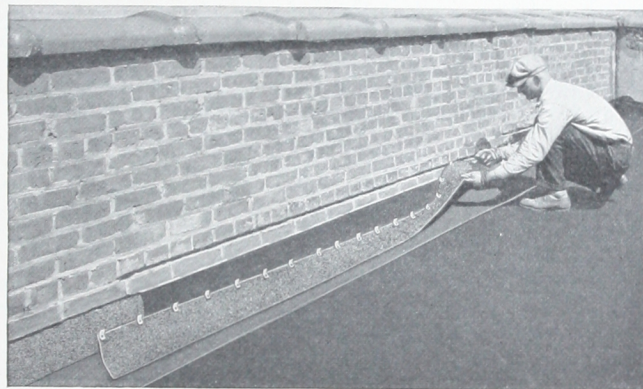
**FIRST**—Mop the entire surface of the deck with USG Asphalt.

**NOTE**—If Precast Concrete Slabs are used, strip mop each slab, staying back three (3) inches from all joints.

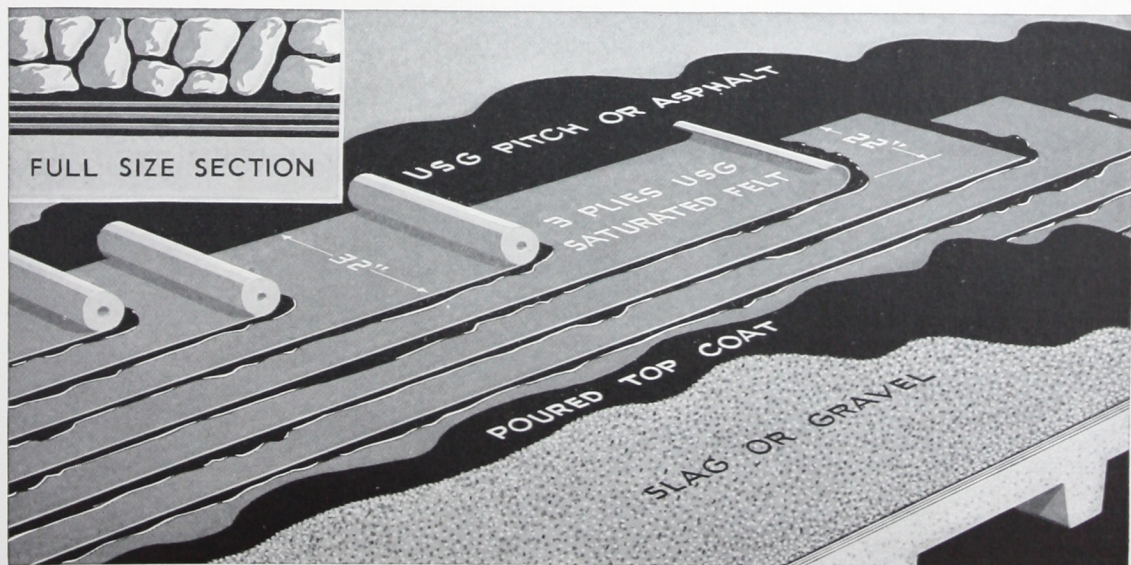
**SECOND**—Into this mopping, while hot, shall be embedded three (3) plies of USG Asphalt Saturated Rag Felt weighing fifteen (15) pounds per one hundred (100) square feet, single thickness, lapping each sheet

twenty-two (22) inches over preceding sheet, cutting the felt off at the top of the cant strip or on all vertical surfaces four (4) inches. Roll each sheet immediately behind the mop to assure a solid mopping of asphalt so that at no point shall felt touch felt. There shall be not less than twenty-five (25) pounds of asphalt used per one hundred (100) square feet in the individual moppings under and between plies of felt (75 pounds total).

**THIRD**—Cover the entire roof surface with a uniform, heavy coat of USG Asphalt poured from a dipper or suitable pouring can, using not less than fifty (50) pounds of asphalt to cover one hundred (100) square feet of roof surface. Into this top coating, while hot, a complete covering of Gravel or Slag shall be thoroughly and uniformly embedded.



**DETAIL OF CONSTRUCTION FOR BUILT-UP ROOF SPECIFICATIONS 4-A AND 4-B**





# USG 20-YEAR BONDED BUILT-UP ROOF . . . *Specification No. 5*

## ASPHALT SMOOTH SURFACED ROOFING • OVER • WOOD OR PRECAST GYPSUM TILE DECKS

- Approved for application in northern section of the United States on roof decks where the incline or slope exceeds 2 inches in 12 inches.
- These roofs are listed by the Underwriters' Laboratories as Class C.
- Preparation and other Requirements applying to Wood and Precast Gypsum Tile Decks shall be in accordance with "Correlative Provisions," page 3 which are a part of these detailed specifications.
- For USG Built-up Bonded Roof Flashings, see pages 38 to 45 inclusive.

The Roofing Contractor shall examine all surfaces upon or against which roofing is to be applied.

He shall determine that the roof deck is properly prepared, slopes to drains are properly constructed, the roof deck is thoroughly dry, smooth, and free from projections above or depressions in the plane of the deck surface, the deck is free from rubbish and debris and ready to receive the roofing materials. He shall notify the Architect of any defects he considers detrimental to the installation of the roofing materials and shall make sure that all defects are corrected before he begins work. The application of roofing materials by the Roofing Contractor will be considered acceptance by him of the roof deck as constructed.

## GENERAL REQUIREMENTS APPLYING to SPECIFICATION NO. 5

**BOND**—The Roofing Contractor shall furnish a United States Gypsum Co. Twenty (20)-Year

Guaranty Bond issued by the National Surety Co.

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**NOTE**—The United States Gypsum Company will furnish its 20-Year Guaranty Bond on all roofs of 5000 square feet or more in the United States where its inspection service is available. The roof must be applied by a Roofing Contractor approved by the United States Gypsum Company in strict accordance with its Bonded Roof Specifications and subject to United States Gypsum Company inspection, acceptance, and approval.

## MATERIALS AND APPLICATION

Simplex flat head roofing nails or galvanized roofing nails driven through flat tin discs shall be used to nail the roofing to the deck. Nails shall be  $\frac{7}{8}$  in. long for wood decks and  $1\frac{1}{4}$  in. long for gypsum decks.

Application of all felts shall start at low points and

be laid at right angle to slope of roof. All end laps shall be not less than six (6) inches. All felts shall be 36 inches wide laid without wrinkles or buckles.

Temperature of USG Asphalt shall never exceed 400° F. in heating kettle.

## SPECIFICATION USG NO. 5 (ASPHALT SATURATED FELT and ASPHALT)

One ply of USG Asphalt Saturated Rag Felt Base Sheet weighing 60 lbs. per 100 sq. ft.; three plies of USG Asphalt Saturated Rag Felt, each ply weighing 15 lbs. per 100 sq. ft.; and not less than 100 lbs. of USG Steep Asphalt shall be used to construct 100 sq. ft. of USG Bonded Built-up Roofing No. 5.

**FIRST**—Apply one (1) layer of USG Asphalt Saturated Rag Felt Base Sheet weighing sixty (60) pounds per one hundred (100) square feet, lapping each sheet two (2) inches over the preceding sheet and extending up to the top of the cant strip or on all vertical surfaces four (4) inches. Secure the base sheet to the roof deck by nailing along the side laps of the sheets, spacing

the nails six (6) inches apart on centers. In addition, the base sheets shall be secured with two (2) staggered rows of nails spaced twelve (12) inches apart on centers located approximately twelve (12) inches from each edge of the sheet.

**SECOND**—Cover the entire surface of the base sheets thus laid with a uniform mopping of USG Asphalt, into which, while hot, shall be embedded three (3) plies of USG Asphalt Saturated Rag Felt weighing fifteen (15) pounds per one hundred (100) square feet, single thickness, lapping each sheet twenty-five (25) inches over the preceding sheet and extending up to the top of the cant strip or on all vertical surfaces four (4) inches. Roll



each sheet immediately behind the mop to assure a solid mopping of asphalt so that at no point shall felt touch felt. There shall be not less than twenty-five (25) pounds of asphalt used per one hundred (100) square feet in the individual moppings under and between plies of felt (75 pounds total). (When the incline of roof exceeds 3" in 12", each sheet shall be nailed every 18" not lower than 3" from the top edge. All nails shall be covered by not less than two plies of felt.)

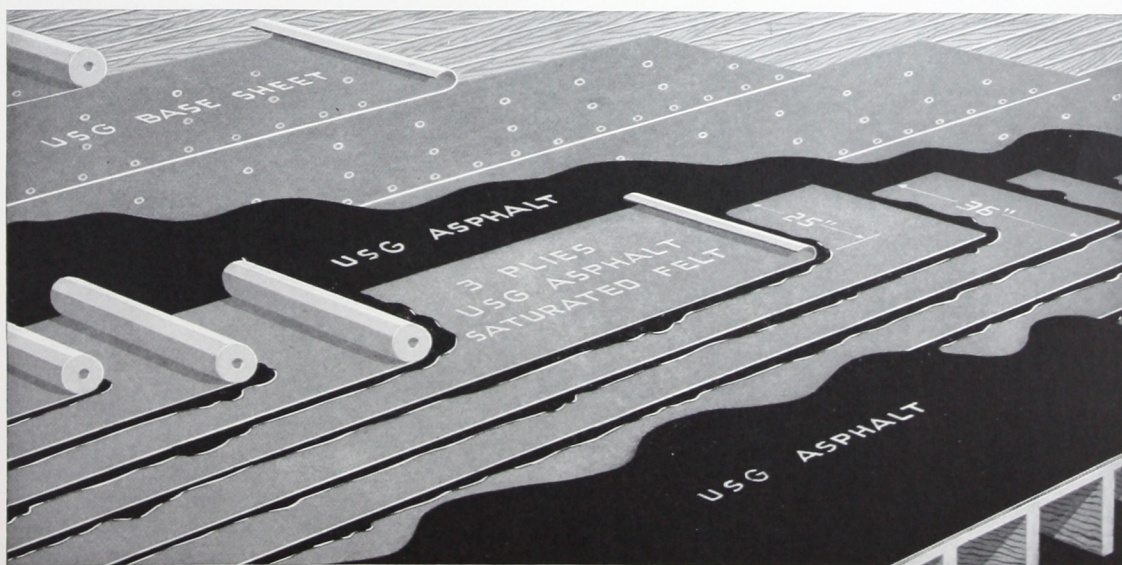
**NOTE**—When the incline of the roof exceeds three (3) inches in twelve (12) inches, the 15-pound USG Asphalt Saturated Rag Felts may be laid parallel to the incline of the roof (at

right angles to the base sheets), and each sheet shall be securely nailed at the crest or ridge of the roof and, in addition, each shall be nailed with two parallel rows of nails spaced twenty-four (24) inches apart on centers. One row of nails shall be located not less than three (3) inches from the unexposed edge of the sheet and the second row of nails not less than twelve (12) inches from the unexposed edge.

**THIRD**—Cover the entire surface of the felts thus laid with a uniform mopping of USG Asphalt, using not more than twenty-five (25) pounds of asphalt to cover one hundred (100) square feet of roof surface.



DETAIL OF CONSTRUCTION FOR BUILT-UP ROOF SPECIFICATION NO. 5





# USG 20-YEAR BONDED BUILT-UP ROOF . . . *Specification No. 6*

• SANDED SURFACE •  
• ASPHALT ROOFING •  
OVER POURED GYPSUM  
OR CONCRETE, PRECAST  
CONCRETE SLAB DECKS

- Approved for application throughout the United States on roof decks where the incline or slope exceeds 2 inches in 12 inches.
- Roofs are listed by Underwriters' Laboratories as Class C.
- Preparation and other Requirements applying to these particular types of decks shall be in accordance with "Correlative Provisions," page 3 which are a part of these detailed specifications.
- For USG Built-up Bonded Flashings, see pages 38 to 45 inclusive.

The Roofing Contractor shall examine all surfaces upon or against which roofing is to be applied. He shall determine that the roof deck is properly prepared, slopes to drains are properly constructed, the roof deck is thoroughly dry, smooth, and free from projections above or depressions in the plane of the deck surface, the deck is free from rubbish and debris and ready to receive the roofing materials. He shall notify the Architect of any defects he considers detrimental to the installation of the roofing materials and shall make sure that all defects are corrected before he begins work. The application of roofing materials by the Roofing Contractor will be considered acceptance by him of the roof deck as constructed.

## GENERAL REQUIREMENTS APPLYING to SPECIFICATION NO. 6

**BOND**—The Roofing Contractor shall furnish a United States Gypsum Co. Twenty (20)-Year

Guaranty Bond issued by the National Surety Co.

**NOTE**—The United States Gypsum Company will furnish its 20-Year Guaranty Bond on all roofs of 5000 square feet or more in the United States where its inspection service is available. The roof must be applied by a Roofing Contractor approved by the United States Gypsum Company in strict accordance with its Bonded Roof Specifications and subject to United States Gypsum Company inspection, acceptance, and approval.

## MATERIALS AND APPLICATION

Simplex flat head roofing nails or galvanized roofing nails driven through flat tin discs shall be used to nail the roofing to the deck. Nails shall be 1 3/4 in. long for gypsum decks.

Application of all felts shall start at low points and

be laid at right angle to slope of roof. All end laps shall be not less than six (6) inches. All felts shall be 36 inches wide laid without wrinkles or buckles.

Temperature of USG Asphalt shall never exceed 400° F. in heating kettle.

## SPECIFICATION USG NO. 6 (ASPHALT SATURATED FELT and ASPHALT)

One gallon of USG Asphalt Primer; three plies of USG Asphalt Saturated Rag Felt, each ply weighing 15 lbs. per 100 sq. ft.; two plies of USG Asphalt Saturated and Sanded Rag Felt Cap Sheet, each ply weighing 34 lbs. per 100 sq. ft.; and not less than 125 lbs. of USG Steep Asphalt shall be used to construct 100 sq. ft. of USG Bonded Built-up Roofing No. 6.

**FIRST**—Coat the entire roof surface with USG Asphalt Primer, using not less than one (1) gallon of primer to cover one hundred (100) square feet of roof surface. Allow sufficient time to dry.

**NOTE**—If Precast Concrete Slabs are used, strip

prime each slab staying back three (3) inches from all joints.

**SECOND**—Mop the entire surface of the deck with USG Asphalt. Into this mopping, while hot, shall be embedded three (3) plies of USG Asphalt Saturated Rag Felt weighing fifteen (15) pounds per one hundred (100) square feet, single thickness, lapping each sheet twenty five (25) inches over the preceding sheet, cutting the felt off at the top of the cant strip or on all vertical surfaces four (4) inches. Roll each sheet immediately behind the mop to assure a solid mopping of asphalt so that at no point shall felt touch felt. There shall be not less than twenty-five (25) pounds of asphalt used



per one hundred (100) square feet in the individual moppings under and between plies of felt (75 pounds total).

**THIRD**—Cover the entire surface of the felt thus laid with a uniform mopping of USG Asphalt, into which, while hot, shall be embedded, coated side up, two (2) plies of USG Asphalt Saturated and Sanded Rag Felt Cap Sheet weighing thirty-four (34) pounds per one hundred (100) square feet, single thickness, lapping each sheet nineteen (19) inches over the preceding sheet, cutting the felt off at the top of the cant strip or at all vertical surfaces. Roll each sheet immediately behind the mop to assure a solid mopping of asphalt so that at no point shall felt touch felt. There shall be not less than twenty-five (25) pounds of asphalt used per one hundred (100) square feet in the individual moppings under and between plies of the cap sheet (50 pounds total).

When the character of the roof permits nailing (poured gypsum decks), each USG Sanded Cap Sheet shall be nailed with two parallel rows of nails spaced twelve (12) inches apart on centers. One row of nails shall be located not lower than three (3) inches from the top edge of the sheet and the second row of nails not lower than twelve (12) inches from the top edge of the sheet.



When the character of the roof surface will not permit nailing (poured concrete or precast concrete slab decks) and nailing strips are provided parallel with the incline of the roof spaced four (4) feet apart on centers, each USG Sanded Cap Sheet shall be nailed to each nailing strip in two parallel rows. One row of nails shall be located not lower than three (3) inches from the top edge of the sheet and the second row not lower than twelve (12) inches from the top edge.

**NOTE**—When the incline of the roof exceeds three (3) inches in twelve (12) inches and the character of the roof will not permit nailing (poured concrete or precast concrete slab decks), the USG Sanded Cap Sheet may be applied in continuous lengths parallel with the incline of the roof (at right angles to the underlying felt) nailed securely at the crest or ridge.

Where steep roofs join flat roofs, the roofing on the flat surfaces shall be carried up the steep surfaces not less than twenty-four (24) inches before the application of the roofing on the steep surfaces. The steep surface roofing shall be carried, full thickness, over this entire lapped juncture and, in addition, at least six (6) inches out over the flat roof surface.

#### DETAIL OF CONSTRUCTION FOR BUILT-UP ROOF SPECIFICATION NO. 6





# USG 10-YEAR BONDED BUILT-UP ROOF . . . *Specification No. 7*

**ASPHALT SMOOTH  
SURFACED ROOFING  
• OVER •  
WOOD OR PRECAST  
GYPSUM TILE DECKS**

- Approved for application in northern section of the United States on roof decks where the incline or slope exceeds 2 inches in 12 inches.
- These roofs are listed by the Underwriters' Laboratories as Class C.
- Preparation and other Requirements applying to Wood and Precast Gypsum Tile Decks shall be in accordance with "Correlative Provisions," page 3 which are a part of these detailed specifications.
- For USG Built-up Bonded Roof Flashings, see pages 38 to 45 inclusive.

The Roofing Contractor shall examine all surfaces upon or against which roofing is to be applied. He shall determine that the roof deck is properly prepared, slopes to drains are properly constructed, the roof deck is thoroughly dry, smooth, and free from projections above or depressions in the plane of the deck surface, the deck is free from rubbish and debris and ready to receive the roofing materials. He shall notify the Architect of any defects he considers detrimental to the installation of the roofing materials and shall make sure that all defects are corrected before he begins work. The application of roofing materials by the Roofing Contractor will be considered acceptance by him of the roof deck as constructed.

## **GENERAL REQUIREMENTS APPLYING to SPECIFICATION NO. 7**

**BOND**—The Roofing Contractor shall furnish a United States Gypsum Co. Ten (10)-Year Guar-

anty Bond issued by the National Surety Co.

**NOTE**—*The United States Gypsum Company will furnish its 10-Year Guaranty Bond on all roofs of 2500 square feet or more in the United States where its inspection service is available. The roof must be applied by a Roofing Contractor approved by the United States Gypsum Company in strict accordance with its Bonded Roof Specifications and subject to United States Gypsum Company inspection, acceptance, and approval.*

## **MATERIALS AND APPLICATION**

Simplex flat head roofing nails or galvanized roofing nails driven through flat tin discs shall be used to nail the roofing to the deck. Nails shall be  $\frac{7}{8}$  in. long for wood decks and  $1\frac{1}{4}$  in. long for gypsum decks.

Application of all felts shall start at low points and

be laid at right angle to slope of roof. All end laps shall be not less than six (6) inches. All felts shall be 36 inches wide laid without wrinkles or buckles.

Temperature of USG Asphalt shall never exceed 400° F. in heating kettle.

## **SPECIFICATION USG NO. 7 (ASPHALT SATURATED FELT and ASPHALT)**

One ply of USG Asphalt Saturated Rag Felt Base Sheet weighing 45 lbs. per 100 sq. ft.; two plies of USG Asphalt Saturated Rag Felt, each ply weighing 15 lbs. per 100 sq. ft.; and not less than 75 lbs. of USG **Steep** Asphalt shall be used to construct 100 sq. ft. of USG Bonded Built-up Roofing No. 7.

**FIRST**—Apply one (1) layer of USG Asphalt Saturated Rag Felt Base Sheet weighing forty-five (45) pounds per one hundred (100) square feet, lapping each sheet two (2) inches over the preceding sheet and extending up to the top of the cant strip or on all vertical surfaces four (4) inches. Secure the base sheet to the roof deck by nailing along the side laps of the sheets, spacing

the nails six (6) inches apart on centers. In addition, the base sheets shall be secured with two (2) staggered rows of nails spaced twelve (12) inches apart on centers located approximately twelve (12) inches from each edge of the sheet.

**SECOND**—Cover the entire surface of the base sheets thus laid with a uniform mopping of USG Asphalt, into which, while hot, shall be embedded two (2) plies of USG Asphalt Saturated Rag Felt weighing fifteen (15) pounds per one hundred (100) square feet, single thickness, lapping each sheet nineteen (19) inches over the preceding sheet and extending up to the top of the cant strip or on all vertical surfaces four (4) inches. Roll each

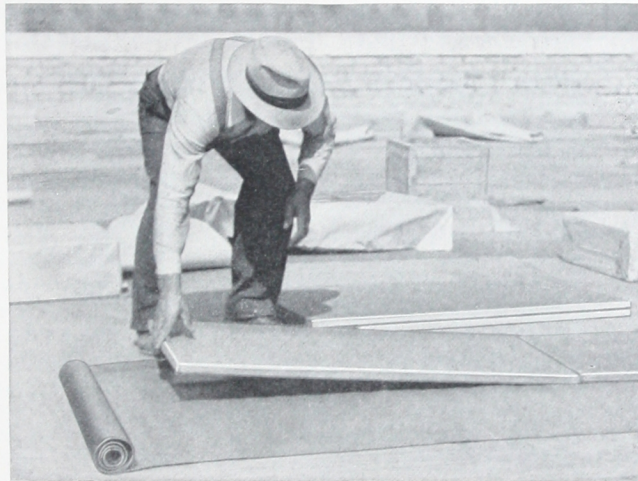


sheet immediately behind the mop to assure a solid mopping of asphalt so that at no point shall felt touch felt. There shall be not less than twenty-five (25) pounds of asphalt used per one hundred (100) square feet in the individual moppings under and between plies of felt (50 pounds total). (When the incline of roof exceeds 3" in 12", each sheet shall be nailed every 18" not lower than 3" from the top edge. All nails shall be covered with one ply of felt.)

**NOTE**—When the incline of the roof exceeds three (3) inches in twelve (12) inches, the 15-pound USG Asphalt Saturated Rag Felts may be laid parallel to the incline of the roof (at

right angles to the base sheets), and each sheet shall be securely nailed at the crest or ridge of the roof and, in addition, each shall be nailed with two parallel rows of nails spaced twenty-four (24) inches apart on centers. One row of nails shall be located not less than three (3) inches from the unexposed edge of the sheet and the second row of nails not less than twelve (12) inches from the unexposed edge.

**THIRD**—Cover the entire surface of the felts thus laid with a uniform mopping of USG Asphalt, using not more than twenty-five (25) pounds of asphalt to cover one hundred (100) square feet of roof surface.



DETAIL OF CONSTRUCTION FOR BUILT-UP ROOF SPECIFICATION NO. 7





# USG 10-YEAR BONDED BUILT-UP ROOF . . . *Specification No. 8*

• SANDED SURFACE •  
• ASPHALT ROOFING •  
OVER POURED GYPSUM  
OR CONCRETE, PRECAST  
CONCRETE SLAB DECKS

- Approved for application throughout the United States on roof decks where the incline or slope exceeds 2 inches in 12 inches.
- Roofs are listed by Underwriters' Laboratories as Class C.
- Preparation and other Requirements applying to these particular types of decks shall be in accordance with "Correlative Provisions," page 3 which are a part of these detailed specifications.
- For USG Built-up Bonded Flashings, see pages 38 to 45 inclusive.

The Roofing Contractor shall examine all surfaces upon or against which roofing is to be applied. He shall determine that the roof deck is properly prepared, slopes to drains are properly constructed, the roof deck is thoroughly dry, smooth, and free from projections above or depressions in the plane of the deck surface, the deck is free from rubbish and debris and ready to receive the roofing materials. He shall notify the Architect of any defects he considers detrimental to the installation of the roofing materials and shall make sure that all defects are corrected before he begins work. The application of roofing materials by the Roofing Contractor will be considered acceptance by him of the roof deck as constructed.

## GENERAL REQUIREMENTS APPLYING to SPECIFICATION NO. 8

**BOND**—The Roofing Contractor shall furnish a United States Gypsum Co. Ten (10)-Year Guar-

anty Bond issued by the National Surety Co.

**NOTE**—*The United States Gypsum Company will furnish its 10-Year Guaranty Bond on all roofs of 2500 square feet or more in the United States where its inspection service is available. The roof must be applied by a Roofing Contractor approved by the United States Gypsum Company in strict accordance with its Bonded Roof Specifications and subject to United States Gypsum Company inspection, acceptance, and approval.*

## MATERIALS AND APPLICATION

Simplex flat head roofing nails or galvanized roofing nails driven through flat tin discs shall be used to nail the roofing to the deck. Nails shall be 1¾ in. long for gypsum decks.

Application of all felts shall start at low points and

be laid at right angle to slope of roof. All end laps shall be not less than six (6) inches. All felts shall be 36 inches wide laid without wrinkles or buckles.

Temperature of USG Asphalt shall never exceed 400° F. in heating kettle.

## SPECIFICATION USG NO. 8 (ASPHALT SATURATED FELT AND ASPHALT)

One gallon of USG Asphalt Primer; two plies of USG Asphalt Saturated Rag Felt, each ply weighing 15 lbs. per 100 sq. ft.; two plies of USG Asphalt Saturated and Sanded Rag Felt Cap Sheet, each ply weighing 34 lbs. per 100 sq. ft.; and not less than 100 lbs. of USG **Steep** Asphalt shall be used to construct 100 sq. ft. of USG Bonded Built-up Roofing No. 8.

**FIRST**—Coat the entire roof surface with USG Asphalt Primer, using not less than one (1) gallon of primer to cover one hundred (100) square feet of roof surface. Allow sufficient time to dry.

**NOTE**—*If Precast Concrete Slabs are used,*

*strip prime each slab staying back three (3) inches from all joints.*

**SECOND**—Mop the entire surface of the deck with USG Asphalt. Into this mopping, while hot, shall be embedded two (2) plies of USG Asphalt Saturated Rag Felt weighing fifteen (15) pounds per one hundred (100) square feet, single thickness, lapping each sheet nineteen (19) inches over the preceding sheet, cutting the felt off at the top of the cant strip or on all vertical surfaces four (4) inches. Roll each sheet immediately behind the mop to assure a solid mopping of asphalt so that at no point shall felt touch felt. There shall be not less than twenty-five (25) pounds of asphalt used



per one hundred (100) square feet in the individual moppings under and between plies of felt (50 pounds total).

**THIRD**—Cover the entire surface of the felt thus laid with a uniform mopping of USG Asphalt, into which, while hot, shall be embedded, coated side up, two (2) plies of USG Asphalt Saturated and Sanded Rag Felt Cap Sheet weighing thirty-four (34) pounds per one hundred (100) square feet, single thickness, lapping each sheet nineteen (19) inches over the preceding sheet, cutting the felt off at the top of the cant strip or at all vertical surfaces. Roll each sheet immediately behind the mop to assure a solid mopping of asphalt so that at no point shall felt touch felt. There shall be not less than twenty-five (25) pounds of asphalt used per one hundred (100) square feet in the individual moppings under and between plies of the cap sheet (50 pounds total).

When the character of the roof permits nailing (poured gypsum decks), each USG Sanded Cap Sheet shall be nailed with two parallel rows of nails spaced twelve (12) inches apart on centers. One row of nails shall be located not lower than three (3) inches from the top edge of the sheet and the second row of nails not lower than twelve (12) inches from the top edge of the sheet.

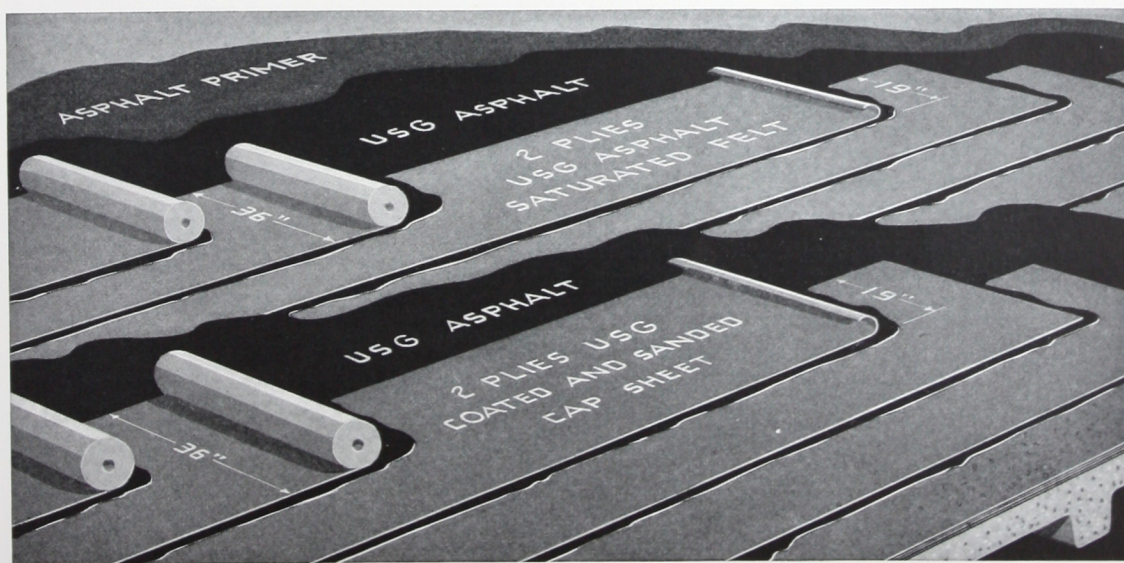


When the character of the roof surface will not permit nailing (poured concrete or precast concrete slab decks) and nailing strips are provided parallel with the incline of the roof spaced four (4) feet apart on centers, each USG Sanded Cap Sheet shall be nailed to each nailing strip in two parallel rows. One row of nails shall be located not lower than three (3) inches from the top edge of the sheet and the second row not lower than twelve (12) inches from the top edge.

**NOTE**—When the incline of the roof exceeds three (3) inches in twelve (12) inches and the character of the roof will not permit nailing (poured concrete or precast concrete slab decks), the USG Sanded Cap Sheet may be applied in continuous lengths parallel with the incline of the roof (at right angles to the underlying felt) nailed securely at the crest or ridge.

Where steep roofs join flat roofs, the roofing on the flat surfaces shall be carried up the steep surfaces not less than twenty-four (24) inches before the application of the roofing on the steep surfaces. The steep surface roofing shall be carried, full thickness, over this entire lapped juncture and, in addition, at least six (6) inches out over the flat roof surface.

#### DETAIL OF CONSTRUCTION FOR BUILT-UP ROOF SPECIFICATION NO. 8





# USG 20-YEAR BONDED BUILT-UP ROOF . . . *Specification No. 9*

## SEL-VI-LAP MINERAL SURFACED ROOFING OVER WOOD OR PRECAST GYPSUM TILE DECKS

The Roofing Contractor shall examine all surfaces upon or against which roofing is to be applied. He shall determine that the roof deck is properly prepared, slopes to drains are properly constructed, the roof deck is thoroughly dry, smooth, and free from projections above or depressions in the plane of the deck surface, the deck is free from rubbish and debris and ready to receive the roofing materials. He shall notify the Architect of any defects he considers detrimental to the installation of the roofing materials and shall make sure that all defects are corrected before he begins work. The application of roofing materials by the Roofing Contractor will be considered acceptance by him of the roof deck as constructed.

## GENERAL REQUIREMENTS APPLYING to SPECIFICATION NO. 9

- Approved for application throughout the United States on roof decks where the incline or slope exceeds one (1) inch in twelve (12) inches.
- These roofs are listed by the Underwriters' Laboratories as Class C.
- Preparation and other Requirements applying to Wood and Precast Gypsum Tile Decks shall be in accordance with "Correlative Provisions," page 3 which are a part of these detailed specifications.
- For USG Built-up Bonded Roof Flashings, see pages 38 to 45 inclusive.

**BOND**—The Roofing Contractor shall furnish a United States Gypsum Co. Twenty (20)-Year

Guaranty Bond issued by the National Surety Co.

. . .

**NOTE**—*The United States Gypsum Company will furnish its 20-Year Guaranty Bond on all roofs of 5000 square feet or more in the United States where its inspection service is available. The roof must be applied by a Roofing Contractor approved by the United States Gypsum Company in strict accordance with its Bonded Roof Specifications and subject to United States Gypsum Company inspection, acceptance, and approval.*

## MATERIALS AND APPLICATION

Simplex flat head roofing nails or galvanized roofing nails driven through flat tin discs shall be used to nail the roofing to the deck. Nails shall be  $\frac{7}{8}$  in. long for wood decks and  $1\frac{1}{4}$  in. long for gypsum decks.

Application of all felts shall start at low points and

be laid at right angle to slope of roof. All end laps shall be not less than six (6) inches. All felts shall be 36 inches wide laid without wrinkles or buckles.

Temperature of USG Asphalt shall never exceed 400° F. in heating kettle.

## SPECIFICATION USG NO. 9

### (MINERAL SURFACED CAP SHEET, ASPHALT SATURATED FELT and ASPHALT)

Three plies of USG Asphalt Saturated Rag Felt, each ply weighing 15 lbs. per 100 sq. ft., and one layer of USG Sel-vi-lap Mineral Surfaced Rag Felt Roofing weighing 85 lbs. per 100 sq. ft., and not less than 75 lbs. of USG **Steep** Asphalt shall be used to construct 100 sq. ft. of USG Bonded Built-up Roofing No. 9.

**NOTE**—*USG Sel-vi-lap Mineral Surfaced Cap Sheet Roofing shall be cut into sheets approximately 8 feet long. Cut the roll at right angles to the 4 inch longitudinal selvage to include one (1) 6-inch end selvage on each sheet. Stack the sheets flat in piles on the roof, mineral face down.*

**FIRST**—The roof deck shall be covered with a layer of Red Rosin Sized Sheathing Paper weighing not less than five (5) pounds per one hundred (100) square feet. Paper shall be lapped two (2) inches and secured to the deck by occasional nailing.

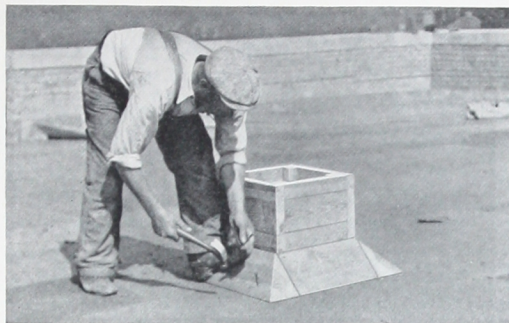
**SECOND**—Apply three (3) plies of USG Asphalt Saturated Rag Felt, weighing fifteen (15) pounds per one hundred (100) square feet, single thickness, lapping each sheet twenty-five (25) inches over the preceding sheet and embedded in a mopping of hot USG Asphalt. Roll each sheet immediately behind the mop to assure a solid mopping of asphalt the full width of the twenty-five (25) inch lap so that at no point shall felt touch felt.



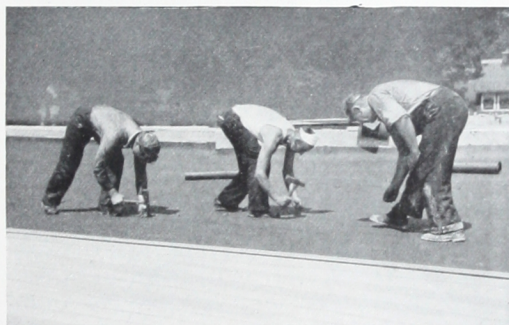
There shall be not less than twenty (20) pounds of asphalt used per one hundred (100) square feet in the individual moppings between plies of felt (40 pounds total). Felt shall be extended to the top of the cant strip or on all vertical surfaces four (4) inches. Each sheet shall be nailed every six (6) inches not lower than twelve (12) inches from the top edge. All nails shall be covered with not less than two plies of felt.

**THIRD**—Cover the entire surface of the felt thus laid with a uniform mopping of USG Asphalt, using not less than twenty-five (25) pounds of asphalt to cover one hundred (100) square feet of roof surface. Into this mopping, while hot, shall be embedded the USG Sel-vi-lap Mineral Surfaced Cap Sheet Roofing, applied in units approximately eight (8) feet long, preferably at right angles to the underlying felt. Break joints of transverse end laps of units in alternate courses. Seal the full width of the four (4) inch longitudinal side lap and the six (6) inch transverse end lap with a mop-

ping of USG Asphalt, into which, while hot, the exposed edges of the next overlapping cap sheet shall be carefully embedded and firmly pressed down to assure complete, positive adhesion between plies along the selvages. Care must be used when mopping the selva laps to avoid dripping asphalt on the exposed mineral surface of the preceding sheet.

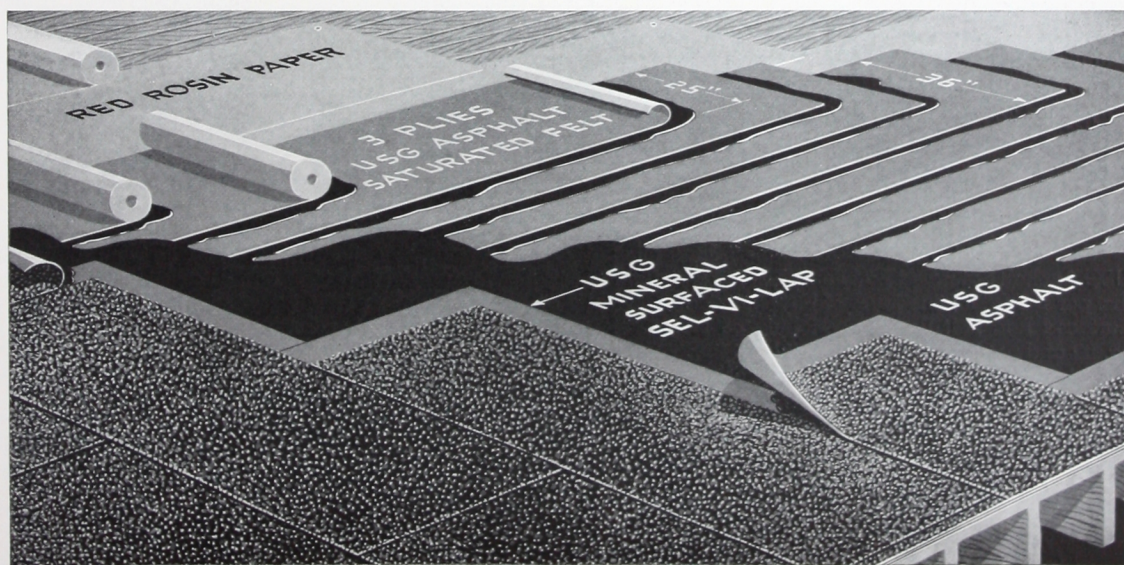


When the incline of the roof exceeds three (3) inches in twelve (12) inches, the Sel-vi-lap Cap Sheet shall be laid at right angles to the slope of the roof nailed every twelve (12) inches along the longitudinal selva laps not more than two (2) inches from the edge of the sheet.



Where steep roofs join flat roofs, the roofing on the flat surfaces shall be carried up the steep surfaces not less than twenty-four (24) inches before the application of the roofing on the steep surfaces. The steep surface roofing shall be carried, full thickness, over this entire lapped juncture and, in addition, at least six (6) inches out over the flat roof surface.

#### DETAIL OF CONSTRUCTION FOR BUILT-UP ROOF SPECIFICATION NO. 9





# USG 20-YEAR BONDED BUILT-UP ROOF . . . *Specification No. 10*

## SEL-VI-LAP MINERAL SURFACED ROOFING OVER POURED GYPSUM OR CONCRETE, PRECAST CONCRETE SLAB DECKS

The Roofing Contractor shall examine all surfaces upon or against which roofing is to be applied. He shall determine that the roof deck is properly prepared, slopes to drains are properly constructed, the roof deck is thoroughly dry, smooth, and free from projections above or depressions in the plane of the deck surface, the deck is free from rubbish and debris and ready to receive the roofing materials. He shall notify the Architect of any defects he considers detrimental to the installation of the roofing materials and shall make sure that all defects are corrected before he begins work. The application of roofing materials by the Roofing Contractor will be considered acceptance by him of the roof deck as constructed.

## GENERAL REQUIREMENTS APPLYING to SPECIFICATION NO. 10

- Approved for application throughout the United States on roof decks where the incline or slope exceeds 1 inch in 12 inches.
- Roofs are listed by Underwriters' Laboratories as Class C.
- Preparation and other Requirements applying to these particular types of decks shall be in accordance with "Correlative Provisions," page 3 which are a part of these detailed specifications.
- For USG Built-up Bonded Flashings, see pages 38 to 45 inclusive.

**BOND**—The Roofing Contractor shall furnish a United States Gypsum Co. Twenty (20)-Year

Guaranty Bond issued by the National Surety Co.

**NOTE**—*The United States Gypsum Company will furnish its 20-Year Guaranty Bond on all roofs of 5000 square feet or more in the United States where its inspection service is available. The roof must be applied by a Roofing Contractor approved by the United States Gypsum Company in strict accordance with its Bonded Roof Specifications and subject to United States Gypsum Company inspection, acceptance, and approval.*

## MATERIALS AND APPLICATION

Simplex flat head roofing nails or galvanized roofing nails driven through flat tin discs shall be used to nail the roofing to the deck. Nails shall be 1 3/4 in. long for gypsum decks.

Application of all felts shall start at low points and

be laid at right angle to slope of roof. All end laps shall be not less than six (6) inches. All felts shall be 36 inches wide and laid without wrinkles or buckles.

Temperature of USG Asphalt shall never exceed 400° F. in heating kettle.

## SPECIFICATION USG NO. 10 (MINERAL SURFACED CAP SHEET, ASPHALT SATURATED FELT and ASPHALT)

One gallon of USG Asphalt Primer; three plies of USG Asphalt Saturated Rag Felt, each ply weighing 15 lbs. per 100 sq. ft.; one layer of USG Sel-vi-lap Mineral Surfaced Rag Felt Roofing weighing 85 lbs. per 100 sq. ft.; and not less than 105 lbs. of USG **Steep** Asphalt shall be used to construct 100 sq. ft. of USG Bonded Built-up Roofing No. 10.

**NOTE**—*USG Sel-vi-lap Cap Sheet Roofing shall be cut into sheets approximately 8 feet long. Cut the roll at right angles to the 4-inch longitudinal selvage to include one (1) 6-inch end selvage on each sheet. Stack the sheets flat in piles on the roof, mineral face down.*

**FIRST**—Coat the entire roof surface with USG Asphalt Primer, using not less than one (1) gallon of primer to cover one hundred (100) square feet of roof surface. Allow sufficient time to dry.

**NOTE**—*If Precast Concrete Slabs are used, strip prime each slab staying back three (3) inches from all joints.*

**SECOND**—Mop the entire surface of the deck with USG Asphalt. Into this mopping, while hot, shall be embedded three (3) plies of USG Asphalt Saturated Rag Felt weighing fifteen (15) pounds per one hundred (100) square feet, single thickness, lapping each sheet



twenty-five (25) inches over the preceding sheet, cutting the felt off at the top of the cant strip or on all vertical surfaces four (4) inches. Roll each sheet immediately behind the mop to assure a solid mopping of asphalt so that at no point shall felt touch felt. There shall be not less than twenty-five (25) pounds of asphalt used per one hundred (100) square feet in the individual moppings under and between plies of felt (75 pounds total).

**THIRD**—Cover the entire surface of the felt thus laid with a uniform mopping of USG Asphalt, using not less than twenty-five (25) pounds of asphalt to cover one hundred (100) square feet of roof surface. Into this mopping, while hot, shall be embedded the USG Sel-vi-lap Mineral Surfaced Cap Sheet Roofing, applied in units approximately eight (8) feet long, preferably at right angles to the underlying felt. Break joints of transverse end laps of units in alternate courses. Seal the full width of the four (4) inch longitudinal side lap and the six (6) inch transverse end lap with a mopping of USG Asphalt, into which, while hot, the exposed edges of the next overlapping cap sheet shall be carefully embedded and firmly pressed down to assure complete, positive adhesion between plies along the selvages. Care must be used when mopping the selvage laps to avoid dripping asphalt on the ex-

posed mineral surface of the previously laid sheet.

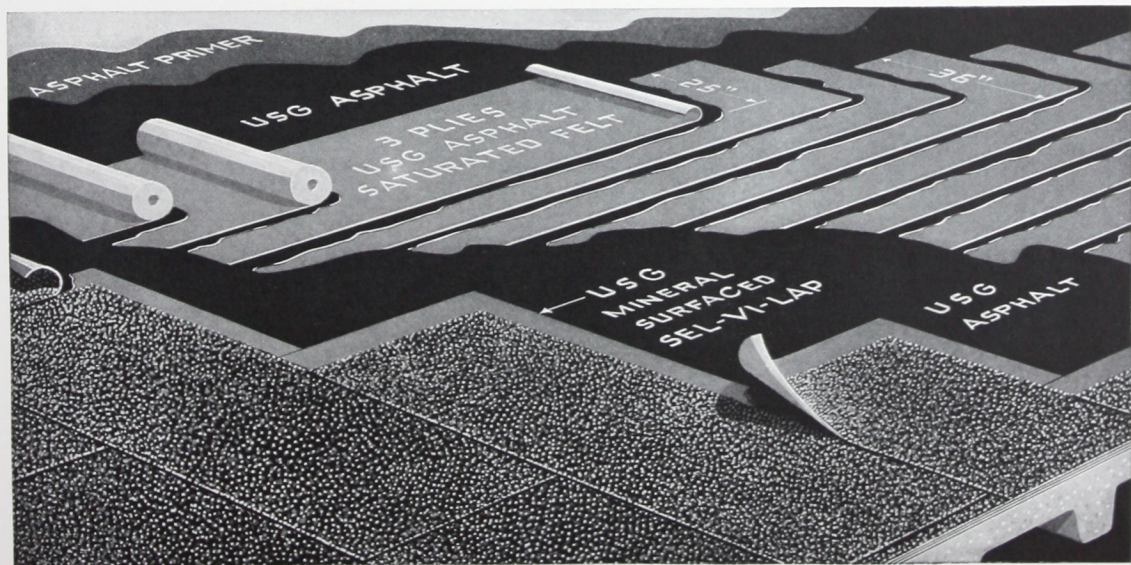
When the incline of the roof exceeds three (3) inches in twelve (12) inches and the character of the roof permits nailing (poured gypsum decks), the USG Sel-vi-lap Mineral Surfaced Cap Sheet shall be laid at right angles to the slope of the roof (parallel with the underlying felt) and shall be nailed every twelve (12) inches along the longitudinal selvage not more than two (2) inches from the edge of the sheet.

When the incline of the roof exceeds three (3) inches in twelve (12) inches and the character of the roof will not permit nailing (poured concrete or precast concrete slab decks), the Sel-vi-lap Cap Sheet will be furnished with the four (4) inch longitudinal selvage only (without transverse six (6) inch selvage end laps) and shall be applied in continuous lengths (not eight (8) foot units) parallel with the incline of the roof nailed securely at the crest or ridge.



Where steep roofs join flat roofs, the roofing on the flat surfaces shall be carried up the steep surfaces not less than twenty-four (24) inches before the application of the roofing on the steep surfaces. The steep surface roofing shall be carried, full thickness, over this entire lapped juncture and, in addition, at least six (6) inches out over the flat roof surface.

**DETAIL OF CONSTRUCTION FOR BUILT-UP ROOF SPECIFICATION NO. 10**





# USG 10-YEAR BONDED BUILT-UP ROOF . . . *Specification No. 11*

## SEL-VI-LAP MINERAL SURFACED ROOFING OVER WOOD OR PRECAST GYPSUM TILE DECKS

The Roofing Contractor shall examine all surfaces upon or against which roofing is to be applied. He shall determine that the roof deck is properly prepared, slopes to drains are properly constructed, the roof deck is thoroughly dry, smooth, and free from projections above or depressions in the plane of the deck surface, the deck is free from rubbish and debris and ready to receive the roofing materials. He shall notify the Architect of any defects he considers detrimental to the installation of the roofing materials and shall make sure that all defects are corrected before he begins work. The application of roofing materials by the Roofing Contractor will be considered acceptance by him of the roof deck as constructed.

## GENERAL REQUIREMENTS APPLYING to SPECIFICATION NO. 11

- Approved for application throughout the United States on roof decks where the incline or slope exceeds one (1) inch in twelve (12) inches.
- These roofs are listed by the Underwriters' Laboratories as Class C.
- Preparation and other Requirements applying to Wood and Precast Gypsum Tile Decks shall be in accordance with "Correlative Provisions," page 3 which are a part of these detailed specifications.
- For USG Built-up Bonded Roof Flashings, see pages 38 to 45 inclusive.

**BOND**—The Roofing Contractor shall furnish a United States Gypsum Co. Ten (10)-Year Guaranty Bond issued by the National Surety Co.

**NOTE**—*The United States Gypsum Company will furnish its 10-Year Guaranty Bond on all roofs of 2500 square feet or more in the United States where its inspection service is available. The roof must be applied by a Roofing Contractor approved by the United States Gypsum Company in strict accordance with its Bonded Roof Specifications and subject to United States Gypsum Company inspection, acceptance, and approval.*

## MATERIALS AND APPLICATION

Simplex flat head roofing nails or galvanized roofing nails driven through flat tin discs shall be used to nail the roofing to the deck. Nails shall be  $\frac{7}{8}$  in. long for wood decks and  $1\frac{1}{4}$  in. long for gypsum decks.

Application of all felts shall start at low points and

be laid at right angle to slope of roof. All end laps shall be not less than six (6) inches. All felts shall be 36 inches wide laid without wrinkles or buckles.

Temperature of USG Asphalt shall never exceed 400° F. in heating kettle.

## SPECIFICATION USG NO. 11 (MINERAL SURFACED CAP SHEET, ASPHALT SATURATED FELT and ASPHALT)

Two plies of USG Asphalt Saturated Rag Felt, each ply weighing 15 lbs. per 100 sq. ft., and one layer of USG Sel-vi-lap Mineral Surfaced Rag Felt Roofing weighing 85 lbs. per 100 sq. ft., and not less than 50 lbs. of USG **Steep** Asphalt shall be used to construct 100 sq. ft. of USG Bonded Built-up Roofing No. 11.

**NOTE**—*USG Sel-vi-lap Mineral Surfaced Cap Sheet Roofing shall be cut into sheets approximately 8 feet long. Cut the roll at right angles to the 4 inch longitudinal selvage to include one (1) 6-inch end selvage on each sheet. Stack the sheets flat in piles on the roof, mineral face down.*

**FIRST**—The roof deck shall be covered with a layer of Red Rosin Sized Sheathing Paper weighing not less than five (5) pounds per one hundred (100) square feet. Paper shall be lapped two (2) inches and secured to the deck by occasional nailing.

**SECOND**—Apply two (2) plies of USG Asphalt Saturated Rag Felt weighing fifteen (15) pounds per one hundred (100) square feet, single thickness, lapping each sheet nineteen (19) inches over the preceding sheet and embedded in a mopping of hot USG Asphalt. Roll each sheet immediately behind the mop to assure a solid mopping of asphalt the full width of the nineteen (19) inch lap so that at no point shall felt touch felt.



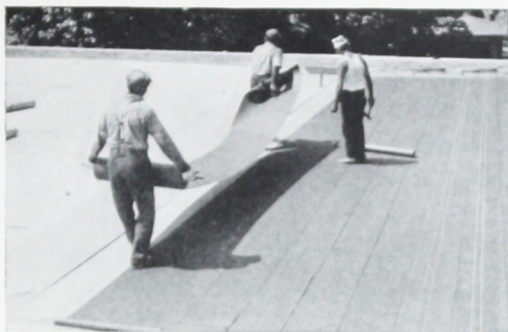
There shall be not less than twenty (20) pounds of asphalt used per one hundred (100) square feet in the individual moppings between plies of felt (20 pounds total). Felt shall be extended to the top of the cant strip or on all vertical surfaces four (4) inches. Each sheet shall be nailed every six (6) inches not lower than three (3) inches from the top edge of the sheet. All nails shall be covered with one ply of felt.

**THIRD**—Cover the entire surface of the felt thus laid with a uniform mopping of USG Asphalt, using not less than twenty-five (25) pounds of asphalt to cover one hundred (100) square feet of roof surface. Into this mopping, while hot, shall be embedded the USG Sel-vi-lap Mineral Surfaced Cap Sheet Roofing, applied in units approximately eight (8) feet long, preferably at right angles to the underlying felt. Break joints of transverse end laps of units in alternate courses. Seal the full width of the four (4) inch longitudinal side lap and the six (6) inch transverse end lap with a mop-

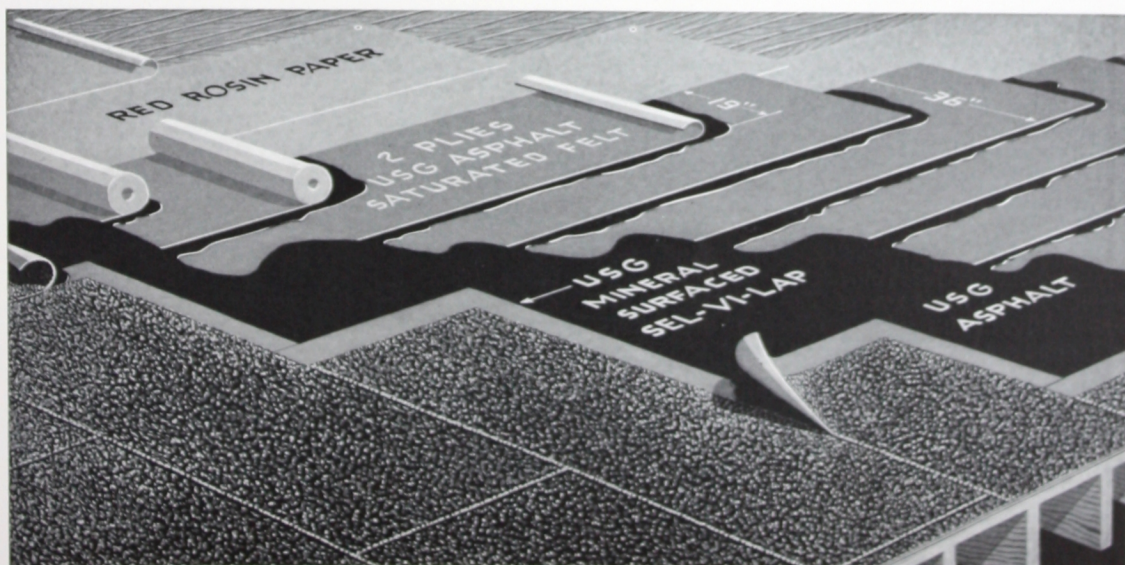
ping of USG Asphalt, into which, while hot, the exposed edges of the next overlapping cap sheet shall be carefully embedded and firmly pressed down to assure complete, positive adhesion between plies along the selvages. Care must be used when mopping the selvage laps to avoid dripping asphalt on the exposed mineral surface of the preceding sheet.

When the incline of the roof exceeds three (3) inches in twelve (12) inches, the Sel-vi-lap Cap Sheet shall be laid at right angles to the slope of the roof nailed every twelve (12) inches along the longitudinal selvage not more than two (2) inches from the edge of the sheet.

Where steep roofs join flat roofs, the roofing on the flat surfaces shall be carried up the steep surfaces not less than twenty-four (24) inches before the application of the roofing on the steep surfaces. The steep surface roofing shall be carried, full thickness, over this entire lapped juncture and, in addition, at least six (6) inches out over the flat roof surface.



DETAIL OF CONSTRUCTION FOR BUILT-UP ROOF SPECIFICATION NO. 11





# USG 10-YEAR BONDED BUILT-UP ROOF . . . *Specification No. 12*

## SEL-VI-LAP MINERAL SURFACED ROOFING OVER POURED GYPSUM OR CONCRETE, PRECAST CONCRETE SLAB DECKS

The Roofing Contractor shall examine all surfaces upon or against which roofing is to be applied. He shall determine that the roof deck is properly prepared, slopes to drains are properly constructed, the roof deck is thoroughly dry, smooth, and free from projections above or depressions in the plane of the deck surface, the deck is free from rubbish and debris and ready to receive the roofing materials. He shall notify the Architect of any defects he considers detrimental to the installation of the roofing materials and shall make sure that all defects are corrected before he begins work. The application of roofing materials by the Roofing Contractor will be considered acceptance by him of the roof deck as constructed.

## GENERAL REQUIREMENTS APPLYING to SPECIFICATION NO. 12

- Approved for application throughout the United States on roof decks where the incline or slope exceeds 1 inch in 12 inches.
- Roofs are listed by Underwriters' Laboratories as Class C.
- Preparation and other Requirements applying to these particular types of decks shall be in accordance with "Correlative Provisions," page 3 which are a part of these detailed specifications.
- For USG Built-up Bonded Flashings, see pages 38 to 45 inclusive.

**BOND**—The Roofing Contractor shall furnish a United States Gypsum Co. Ten (10)-Year Guar-

anty Bond issued by the National Surety Co.

**NOTE**—*The United States Gypsum Company will furnish its 10-Year Guaranty Bond on all roofs of 2500 square feet or more in the United States where its inspection service is available. The roof must be applied by a Roofing Contractor approved by the United States Gypsum Company in strict accordance with its Bonded Roof Specifications and subject to United States Gypsum Company inspection, acceptance, and approval.*

## MATERIALS AND APPLICATION

Simplex flat head roofing nails or galvanized roofing nails driven through flat tin discs shall be used to nail the roofing to the deck. Nails shall be 1 3/4 in. long for gypsum decks.

Application of all felts shall start at low points and

be laid at right angle to slope of roof. All end laps shall be not less than six (6) inches. All felts shall be 36 inches wide and shall be laid without wrinkles or buckles.

Temperature of USG Asphalt shall never exceed 400° F. in heating kettle.

## SPECIFICATION USG NO. 12

### (MINERAL SURFACED CAP SHEET, ASPHALT SATURATED FELT and ASPHALT)

One gallon of USG Asphalt Primer; two plies of USG Asphalt Saturated Rag Felt, each ply weighing 15 lbs. per 100 sq. ft.; one layer of USG Sel-vi-lap Mineral Surfaced Rag Felt Roofing weighing 85 lbs. per 100 sq. ft.; and not less than 80 lbs. of USG **Steep** Asphalt shall be used to construct 100 sq. ft. of USG Bonded Built-up Roofing No. 12.

**NOTE**—*USG Sel-vi-lap Cap Sheet Roofing shall be cut into sheets approximately 8 feet long. Cut the roll at right angles to the 4-inch longitudinal selvage to include one (1) 6-inch end selvage on each sheet. Stack the sheets flat in piles on the roof, mineral face down.*

**FIRST**—Coat the entire roof surface with USG Asphalt Primer, using not less than one (1) gallon of primer to cover one hundred (100) square feet of roof surface. Allow sufficient time to dry.

**NOTE**—*If Precast Concrete Slabs are used, strip prime each slab staying back three (3) inches from all joints.*

**SECOND**—Mop the entire surface of the deck with USG Asphalt. Into this mopping, while hot, shall be embedded two (2) plies of USG Asphalt Saturated Rag Felt weighing fifteen (15) pounds per one hundred (100) square feet, single thickness, lapping each sheet nine-



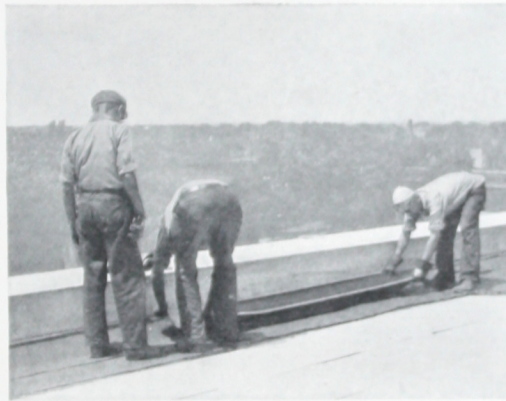
teen (19) inches over the preceding sheet, cutting the felt off at the top of the cant strip or on all vertical surfaces four (4) inches. Roll each sheet immediately behind the mop to assure a solid mopping of asphalt so that at no point shall felt touch felt. There shall be not less than twenty-five (25) pounds of asphalt used per one hundred (100) square feet in the individual moppings under and between plies of felt (50 pounds total).

**THIRD**—Cover the entire surface of the felt thus laid with a uniform mopping of USG Asphalt, using not less than twenty-five (25) pounds of asphalt to cover one hundred (100) square feet of roof surface. Into this mopping, while hot, shall be embedded the USG Sel-vi-lap Mineral Surfaced Cap Sheet Roofing, applied in units approximately eight (8) feet long, preferably at right angles to the underlying felt. Break joints of transverse end laps of units in alternate courses. Seal the full width of the four (4) inch longitudinal side lap and the six (6) inch transverse end lap with a mopping of USG Asphalt, into which, while hot, the exposed edges of the next overlapping cap sheet shall be carefully embedded and firmly pressed down to assure complete, positive adhesion between plies along the selvages. Care must be used when mopping the selvage laps to avoid dripping asphalt on the ex-

posed mineral surface of the previously laid sheet.

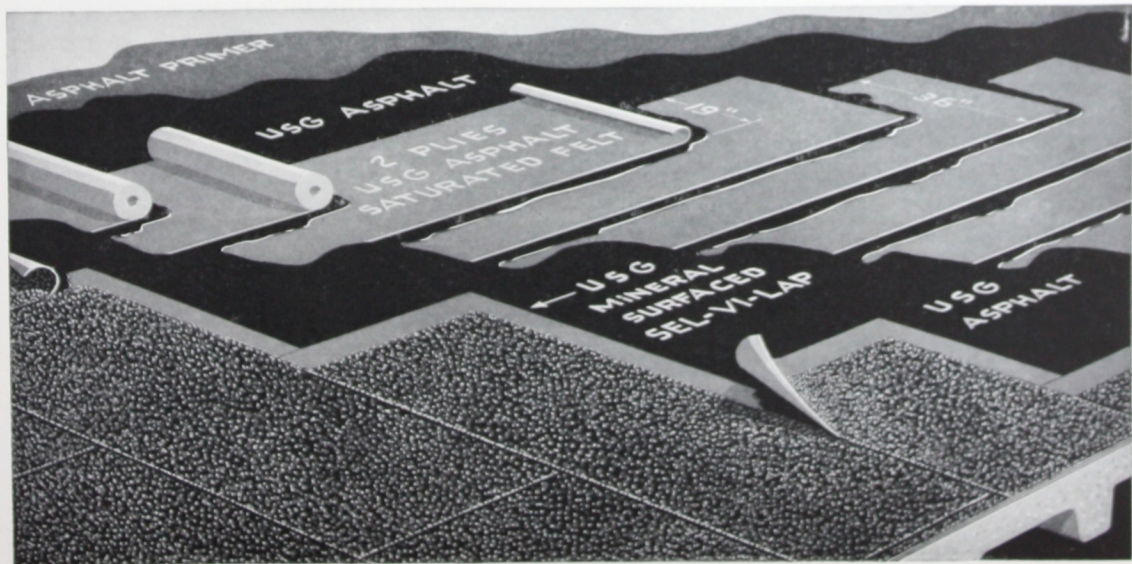
When the incline of the roof exceeds three (3) inches in twelve (12) inches and the character of the roof permits nailing (poured gypsum decks), the USG Sel-vi-lap Mineral Surfaced Cap Sheet shall be laid at right angles to the slope of the roof (parallel with the underlying felt) and shall be nailed every twelve (12) inches along the longitudinal selvage not more than two (2) inches from the edge of the sheet.

When the incline of the roof exceeds three (3) inches in twelve (12) inches and the character of the roof will not permit nailing (poured concrete or precast concrete slab decks), the Sel-vi-lap Cap Sheet will be furnished with the four (4) inch longitudinal selvage only (without transverse six (6) inch selvage end laps) and shall be applied in continuous lengths (not eight (8) foot units) parallel with the incline of the roof nailed securely at the crest or ridge.



Where steep roofs join flat roofs, the roofing on the flat surfaces shall be carried up the steep surfaces not less than twenty-four (24) inches before the application of the roofing on the steep surfaces. The steep surface roofing shall be carried, full thickness, over this entire lapped juncture and, in addition, at least six (6) inches out over the flat roof surface.

DETAIL OF CONSTRUCTION FOR BUILT-UP ROOF SPECIFICATION NO. 12





# USG WEATHERWOOD INSULATION UNDER BUILT-UP ROOFING

• • •

## INTRODUCTION A GUIDE TO GOOD PRACTICE

**GENERAL**—Roof Insulation applied under Built-up Roofing is customarily furnished and applied by the Roofing Contractor. Often the application of the insulation followed immediately by the application of the finished built-up roofing must be executed against time and frequently under unfavorable weather conditions. Again, in the case of monolithic roof decks poured during the winter months, the evaporation of moisture from the slab is not completed before the insulation and roofing are installed.

To be permanently efficient, the insulation must be kept dry before, during, and, most important, after application. To this end the provisions which follow, if clearly set forth in the specifications, will enable the Roofing Contractor to do better and more rapid work and at the same time assure the owner a long lived, effectively insulated roof.

It should be borne in mind that the Guaranty Bond covering the Built-up Roofing and Roof Flashings does not apply to the roof insulation. Replacement of defective insulation, therefore, may involve the owner in costly repairs.

**INSULATION REQUISITES FOR THE APPLICATION OF USG BONDED BUILT-UP ROOFING**—USG Bonded Built-up Roofing will be applied over insulation fulfilling the following requirements:

The insulation shall be of the rigid board or pressure-resisting type (such as USG Weatherwood). Units shall be not larger than 22 inches wide by 47 inches long; of uniform thickness without curled, broken, or ragged corners; free from moisture, dust, and pitted or uneven surfaces; and of sufficient density to retain nails.

**SEAL COURSES**—The seal course is a continuous layer of waterproofing laid over the roof deck beneath the insulation. Together with the finished roof covering applied over the insulation, the seal course sandwiches the insulation between two water and vapor proof layers.

Where high industrial humidities are maintained, seal courses are imperative over wood decks to pre-

vent moisture absorption by the insulation. The same necessity may apply to monolithic and other incombustible deck constructions under certain conditions.

Buildings with concrete and similar decks present several major problems to the roofer. He is often forced to lay the roofing, including the insulation, before other trades have left the roof in order that plastering and other operations within the building may be completed on scheduled time. Again, he may be called upon to work during inclement weather or during weather which prevents the complete drying out of the deck. Damage under these conditions may be done to both insulation and roofing. To provide against such contingencies, it is recommended that the specifications provide for the application of a standard seal course which acts as a temporary waterproof covering for the entire roof area.

**WATER CUT-OFFS**—Water cut-offs installed through the body of the insulation prevent the spread of water beyond predetermined segregated areas in the event of leaks due to damage to the roofing, flashings, defective parapet walls, or copings.

They also provide against damage by sudden showers and over-night and week-end interruptions during application of the insulation and roofing.

Their importance is such that it is suggested that the Architect indicate their desired locations with faint lines on the roof plan. This will assist the Roofing Contractor in planning his work so that he may schedule the completion of each area and will serve as a permanent record of their location.

**RECOMMENDED NUMBER OF LAYERS OF INSULATION**—While Weatherwood Roof Insulation is made in various thicknesses from ½ inch to 4 inches in multiples of ½ inch, for the best results the insulation should be laid in two or more layers, the second breaking joints with the first layer.

**BITUMENS AND FELTS**—Specify the same bitumens and felts throughout. Where coal tar pitch is used, all felts should be saturated with the same material. Where asphalt is used, use asphalt saturated felts.



## USG WEATHERWOOD ROOF INSULATION •• DESCRIPTION

**COMPOSITION**—USG Weatherwood Roof Insulation is a felted fiber product treated to make it highly moisture resistant. It is formed on a single cylinder which produces a homogeneous board free from laminations and any tendency to split parallel with the faces.

**NOTE**—United States Gypsum Company has three Insulation Board manufacturing mills: St. Joseph, Missouri; Greenville, Mississippi; and Lisbon Falls, Maine. While the raw materials from which the St. Joseph Mill insulation is made are basically different from those of the Greenville and Lisbon Falls Mills, the physical characteristics of the products of all three mills are essentially the same.

**LOW THERMAL CONDUCTIVITY**—The average established in tests is .33 B.t.u.'s per hour, per inch thickness, per square foot, per degree F. difference in temperature between the two sides.

**RESISTANCE TO MOISTURE—NON-ABSORPTION**—Tests show that this board, after being submerged in water for a period of two (2) hours, has an average water absorption of less than fifteen (15) per cent by weight.

**STRUCTURAL STRENGTH**—The tensile strength of USG Weatherwood Insulation is over 300 pounds per square inch and the modulus of rupture, over 400 pounds.

**NON-COMPRESSIBILITY—RESILIENCE**—When laid over roof decks under standard roofing materials, it is sufficiently firm to prevent fracture of the roofing under normal use.

**THICKNESS AND SIZE**— $\frac{1}{2}$ , 1, 1 $\frac{1}{2}$ , 2, 2 $\frac{1}{2}$ , 3, 3 $\frac{1}{2}$ , and 4 inches thick. It is homogeneous in the  $\frac{1}{2}$  inch thickness and can also be furnished 1 inch thick. On thicknesses greater than  $\frac{1}{2}$  inch, the insulation will be furnished in multiple thicknesses of  $\frac{1}{2}$  inch, waterproof glue or staple laminated. The area of the unit is 22 inches wide by 47 inches long.

## *Insulation Specifications*

### CORRELATIVE PROVISIONS APPLYING TO ROOF INSULATION

**NOTE**—The construction of roof decks and provision for satisfactory surfaces to receive the roof insulation and various miscellaneous provisions by other trades are not a part of the Roofing Contractor's work and are, therefore, not included in the Roof Insulation Specifications. The following provisions, however, should be included as they apply under the proper headings of the specifications to be executed by others.

**ROOF DECK PROVISIONS**—All provisions for the construction and finished condition of the various types of roof decks established under the heading "Correlative Provisions," pages 3 and 4, applying to "Built-up Roofing" shall apply likewise to "Roof Insulation."

Note particularly that steel decks must be insulated before the application of USG Bonded Built-up Roofing will be permitted.

**WOOD NAILING STRIPS**—The General Contractor will provide wood nailing strips to form a nailing base under all sheet metal flashing aprons and flanges of every nature. Strips shall be the full thickness of the insulation and at least 1 in. wider than the apron rigidly secured to the roof deck with nails, lag bolts, expansion bolts, or other means of attachment as best adapted to the particular construction.

**CANT STRIPS**—Allow for the full insulation thick-

ness above the roof deck surface where cant strips are required. Cant strips shall be provided as set forth on page 4. Cant strips on wood decks shall be set on top of the insulation secured by nailing through the insulation to deck proper. On incombustible decks where the cant is formed with gypsum mortar or concrete, provide a square shoulder the full insulation thickness at the toe of the cant above which the standard cant shall be formed.

**FLASHING RAGGLES**—In establishing the height of flashing raggles and nailing strips, add the thickness of the insulation to the heights required for uninsulated roofs as set forth on page 4.

**ANCHORS AND GUYS**—All anchors, guys, struts, and similar stays for the support or bracing of heavy ventilators, standpipes, louver enclosures, and similar equipment above the roof shall be rigidly secured to the roof deck proper and not to the insulation.



## GENERAL REQUIREMENTS

### APPLYING to APPLICATION of INSULATION

The Roofing Contractor shall examine all surfaces upon or against which the insulation is to be applied. He shall determine that the roof deck is properly prepared, slopes to drains are properly constructed, the roof deck is thoroughly dry, smooth, and free from projections above or depressions in the plane of the deck surface, the deck is free from rubbish and debris and ready to receive the insulation. He shall likewise

check all nailing strips installed to form a nailing base under sheet metal flashing aprons and flanges and shall notify the Architect of any defects he considers detrimental to the installation of the insulation and shall make sure that all defects are corrected before he begins work. The application of insulation by the Roofing Contractor will be considered acceptance by him of the roof deck as constructed.

## MATERIALS AND APPLICATION

### APPLYING to SPECIFICATIONS NOS. 100, 200, 300 and 400

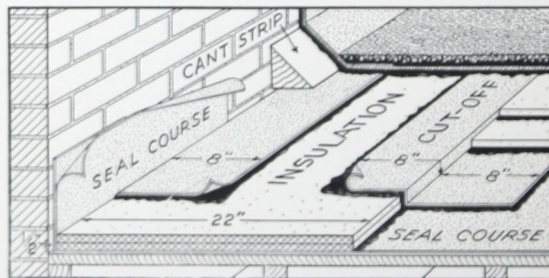
**NOTE**—Notes in bold face type are explanatory or advisory only and should not be included in the specification. Wherever words or phrases occur in the body of the specification paragraph printed in bold face type enclosed in parentheses, choose that word or phrase which applies to the particular work, omitting those that are irrelevant. Wherever the word "Specify" occurs in bold face type enclosed in parentheses, add the particular word or clause applicable.

#### WORK INCLUDED—

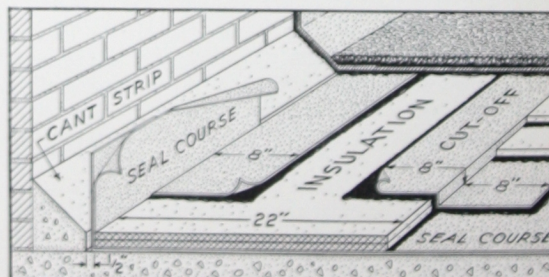
**NOTE**—List and locate the roof areas to be insulated. If more than one thickness of insulation is required on various roof areas, list and locate each separately.

**INSULATION MATERIAL**—Insulation shall be USG Weatherwood Roof Insulation as made by United States Gypsum Company, Chicago. Insulation shall be (specify) thick, laid in (one) (two) layer(s) (water-proof glue laminated) (staple laminated). Units shall be not larger than 22x47 inches in area. Insulation shall be kept dry before, during, and after application. Units shall be free from surface abrasions, curled or broken edges and corners.

**NAILS**—Nails shall be Simplex flat head roofing nails or galvanized roofing nails driven through flat tin discs. Nails for paper and felt shall be  $\frac{7}{8}$  in. long for wood decks and  $1\frac{1}{4}$  in. long for gypsum decks. Nails for insulation shall be of sufficient length to pass through the insulation and penetrate into but not through the deck construction.



DETAILS OF CANT STRIPS AND SEAL COURSES





**APPLICATION OF INSULATION**—Only as much insulation shall be laid over the roof area as can be covered by the finished roofing in any one day.

Lay the insulation in **(one) (two) layer(s)** over the entire roof area. Adjoining edges of the insulation units shall be brought to a moderate contact but shall not be forced into place. Where the insulation meets vertical surfaces, such as parapets, penthouses, and curbs, the insulation units shall be cut in a neat, workmanlike manner allowing at least  $\frac{1}{2}$  in. clearance. Insulation units shall be laid with the length at right angles to the slope of the roof in parallel courses with end joints in each course breaking with those of adjoining courses.

Where insulation is laid in two (2) layers, the insulation units of the second layer shall be laid parallel with those of the first layer, and all joints of the second layer shall break with those of the first layer.

**WATER CUT-OFFS**—The insulation, whether laid in one (1) or two (2) layers, shall be cut to the line designated for the water cut-off.

Water cut-offs shall consist of strips of **(tar) (asphalt)** saturated roofing felt weighing 15 lbs. per 100 sq. ft. not less than 16 in. wide. One half ( $\frac{1}{2}$ ) the width of the strip shall be thoroughly and firmly embedded in hot bitumen to the deck and the remaining one half ( $\frac{1}{2}$ ) carried up and over the edge of the insulation and thoroughly and firmly embedded in hot bitumen to the top surface of the insulation.

Cut-offs shall be located approximately 22 in. from

and parallel with all vertical walls, such as parapets, penthouses, curbs, and around all leader heads, down spouts, soil pipes, vents, and ventilators. The body or field of the roof insulation shall be divided into rectangular areas approximately 30 ft. on a side, each area isolated with a water cut-off. Insert a water cut-off surrounding each day's work if the stop is not made at the designated water cut-off.

The first layer of the finished roofing shall be mopped to the water cut-off each night.

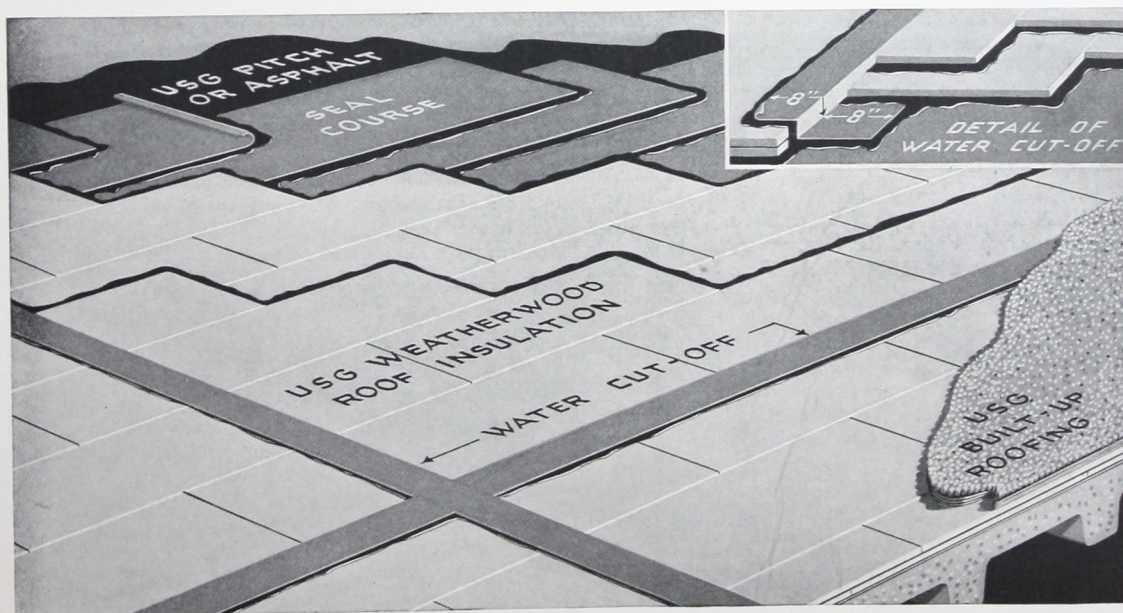
**NOTE**—Water cut-offs are customarily omitted where insulation is laid over a wood deck not first covered by a seal course as in Specification No. 100.

**TEMPERATURE OF BITUMEN**—Temperature of USG (Coal Tar Pitch) (Asphalt) shall never exceed 400° F. in the heating kettle.

#### APPLICATION OF USG BUILT-UP ROOFING OVER INSULATION

**NOTE**—Any USG Built-up Roofing designed for application over Poured Gypsum, Poured Concrete, or Precast Concrete Slab Decks may be applied over the insulation. Apply USG Built-up Roofing, Specifications Nos. 2A or 2B and Nos. 4A or 4B (pages 7 and 11 respectively) exactly as written. In the case of USG Built-up Roofing Specifications Nos. 6, 8, 10, and 12, omit the First Operation—the surface of the insulation requires no primer. See pages 15, 19, 23 and 27 respectively.

#### DETAILS OF WATER CUT-OFFS USED IN CONJUNCTION WITH INSULATION





## Specification No. 100

### WEATHERWOOD INSULATION OVER WOOD ROOF DECKS UNDER USG BUILT-UP ROOFING WHERE HIGH HUMIDITIES ARE NOT A FACTOR

**BUILDING PAPER**—The roof deck shall be covered with a layer of Red Rosin Sized Sheathing Paper weighing not less than five (5) pounds per one hundred (100) square feet. Paper shall be lapped two (2) inches and secured to the deck by occasional nailing.

**NOTE**—*Building paper may be omitted when insulation is laid in two (2) layers.*

**APPLICATION OF INSULATION**—Each insulation unit shall be secured in place by nailing. Space nails approximately twelve (12) inches apart on centers not less than one (1) inch from each edge (each corner of each unit must be securely nailed). In addition, nail along the longitudinal center line.

Nailing of two (2) layer insulation shall be through the second layer or top only. Do not nail first layer.

## Specification No. 200

### WEATHERWOOD INSULATION OVER WOOD ROOF DECKS UNDER USG BUILT-UP ROOFING WHERE HIGH HUMIDITIES ARE MAINTAINED

**BUILDING PAPER**—The roof deck shall be covered with a layer of Red Rosin Sized Sheathing Paper weighing not less than five (5) pounds per one hundred (100) square feet. Paper shall be lapped two (2) inches and secured to the deck by occasional nailing.

**NOTE**—*Building Paper must be used under the Seal Course where a Gravel or Slag Surfaced Built-up Roofing laid over the insulation requires a low melting point bitumen, such as for USG Built-up Roofing, Specifications Nos. 2A or 2B and Nos. 4A or 4B. Building Paper may be omitted where USG Built-up Roofing, Specifications Nos. 6, 8, 10, or 12 are laid over the insulation.*

**SEAL COURSE**—Apply two (2) plies of USG (Tar) (Asphalt) Saturated Rag Felt weighing fifteen (15) pounds per one hundred (100) square feet, single thickness, lapping each sheet over the preceding sheet seventeen (17) inches for thirty-two (32) inch felt or nineteen (19) inches for thirty-six (36) inch felt. Extend felt up on all vertical surfaces not less than eight (8) inches. Application of felts shall start at low points and be laid at right angles to the slope of the roof. All end laps shall be not less than six (6) inches. Felts shall be laid without wrinkles or buckles and shall be secured to the deck with occasional nailing. Apply a uniform coat of USG (Coal Tar Pitch) (Asphalt) to the full lap so that at no point shall felt touch felt.

After the insulation has been laid over the Seal Course, the turned up eight (8) inch extensions at all vertical surfaces shall be turned down over the ex-

posed surface of the insulation thoroughly and firmly embedded in a uniform coat of hot bitumen.

**NOTE**—*Where tar saturated felts are used, use coal tar pitch. Where asphalt saturated felts are used, use asphalt. Felts and bitumens or the Seal Course should match those selected for the built-up roofing to be applied over the insulation.*

**APPLICATION OF INSULATION**—Mop the entire surface of the Seal Course with a uniform coating of USG (Coal Tar Pitch) (Asphalt) into which, while hot, the insulation units shall be firmly and completely embedded.

When insulation is laid in two (2) layers, mop the entire surface of the first layer with a uniform coating of bitumen into which, while hot, the second layer shall be firmly and completely embedded.

Only sufficient area to provide embedment for a single insulation unit shall be mopped at a time.

There shall be not less than twenty-five (25) pounds of bitumen used per one hundred (100) square feet in the individual moppings.

Each insulation unit shall be secured in place by nailing. Space nails approximately twelve (12) inches apart on centers not less than one (1) inch from each edge (each corner of each unit must be securely nailed). In addition nail along the longitudinal center line.

Nailing of two (2) layer insulation shall be through the second or top layer only. Do not nail first layer.



## Specification No. 300

### WEATHERWOOD INSULATION OVER POURED GYPSUM or CONCRETE, PRECAST GYPSUM TILE, and PRECAST CONCRETE SLAB DECKS UNDER USG BUILT-UP ROOFING

**PRIMER**—Coat the entire roof surface with USG Asphalt Primer, using not less than one (1) gallon of primer to cover one hundred (100) square feet of roof surface. Allow sufficient time to dry.

**NOTE**—Omit primer if low melting point bitumens, either Coal Tar Pitch or Asphalt, are used as required for Gravel or Slag Surfaced Built-up Roofing laid over the insulation (USG Built-up Roofing, Specifications Nos. 2A or 2B and Nos. 4A or 4B). Felts and bitumens used in the Seal Course should match those used in the Built-up Roofing selected for application over the insulation.

**NOTE**—If asphalt saturated felt and high melting point asphalt are used over Precast Tile or Slabs in the Seal Course, strip prime each unit staying back (3) inches from all joints.

**SEAL COURSE**—Mop the entire surface of the deck with USG (Coal Tar Pitch) (Asphalt). Into this mopping, while hot, shall be embedded two (2) plies of USG (Tar) (Asphalt) Saturated Rag Felt weighing fifteen (15) pounds per one hundred (100) square feet, single thickness, lapping each sheet over the preceding sheet seventeen (17) inches for thirty-two (32) inch felt or nineteen (19) inches for thirty-six (36) inch felt. Extend felt up on all vertical surfaces not less than eight (8) inches. Application of felts shall start at low point and be laid at right angles to the slope of the roof. Lay felts without wrinkles or buckles. All end laps shall be not less than six (6) inches. As each ply of felt is laid, apply a uniform coat of USG (Coal Tar Pitch) (Asphalt) to the full lap so that at no point shall felt touch felt.

**NOTE**—If low melting point bitumens are used over Precast Tile or Slabs, strip mop each unit staying back three (3) inches from all joints. (USG Built-up Roofing, Specifications Nos. 2A or 2B and Nos. 4A or 4B). Felts and bitumens or the Seal Course should match those selected for the built-up roofing to be applied over the insulation.

After the insulation has been laid over the Seal Course, the turned up eight

(8) inch extensions at all vertical surfaces shall be turned down over the exposed surface of the insulation, thoroughly and firmly embedded in a uniform coat of hot bitumen.

**APPLICATION OF INSULATION**—Mop the entire surface of the (Seal Course) (deck) with a uniform coating of USG (Coal Tar Pitch) (Asphalt) into which, while hot, the insulation units shall be firmly and completely embedded.

When insulation is laid in two (2) layers, mop the entire surface of the first layer with a uniform coating of bitumen into which, while hot, the second layer shall be firmly and completely embedded.

Only sufficient area to provide embedment for a single insulation unit shall be mopped at a time.

There shall be not less than twenty-five (25) pounds of bitumen used per one hundred (100) square feet in the individual moppings.

When the incline of the roof exceeds three (3) inches in twelve (12) inches and the character of the roof permits nailing (poured gypsum or precast gypsum tile), each insulation unit shall be secured in place by nailing. Space nails approximately twelve (12) inches apart on centers not less than one (1) inch from each edge (each corner of each unit must be securely nailed). In addition, nail along the longitudinal center line. Nailing of two layer insulation shall be through the second or top layer only. Do not nail first layer.

When the incline of the roof exceeds three (3) inches in twelve (12) inches and the character of the roof surface will not permit nailing (poured concrete or precast concrete slab decks) and nailing strips are provided parallel with the incline of the roof spaced four (4) feet apart on centers, insulation units shall be secured to each nailing strip with nails spaced approximately twelve (12) inches apart on centers. Nailing of two (2) layer insulation shall be through the second or top layer only. Do not not nail first layer of insulation.





## Specification No. 400

### WEATHERWOOD INSULATION OVER STEEL ROOF DECKS UNDER USG BUILT-UP ROOFING

**NOTE**—Steel decks must be insulated before the application of USG Bonded Built-up Roofing will be permitted.

**NOTE**—Use only steep asphalt and asphalt saturated felts in constructing seal courses, applying insulation, and constructing built-up roofing over steel decks.

**NOTE**—Always include a Seal Course if high humidity is present beneath the steel roof deck.

**SEAL COURSE**—Mop the entire surface of the deck with USG Asphalt. Into this mopping, while hot, shall be embedded two (2) plies of USG Asphalt Saturated Rag Felt weighing fifteen (15) pounds per one hundred (100) square feet, single thickness, lapping each sheet over the preceding sheet seventeen (17) inches for thirty-two (32) inch felt or nineteen (19) inches for thirty-six (36) inch felt. Extend felt up on all vertical surfaces not less than eight (8) inches. Application of felts shall start at low point and be laid at right angles to the slope of the roof. All end laps shall be not less than six (6) inches. Felts shall be laid without wrinkles or buckles. Apply a uniform coat of USG Asphalt to the full lap so that at no point shall felt touch felt.

After the insulation has been laid over the Seal Course, the turned up eight (8) inch extensions at all vertical surfaces shall be turned down over the exposed surface of the insulation, thoroughly and firmly embedded in a uniform coat of asphalt.

**APPLICATION OF INSULATION**—Mop the entire surface of the (Seal Course) (deck) with a uniform coating of USG Asphalt into which, while hot, the insulation units shall be firmly and completely embedded.

Where insulation is laid in two (2) layers, mop the entire surface of the first layer with a uniform coating of asphalt into which, while hot, the second layer shall be firmly and completely embedded.

Only sufficient area to provide embedment for a single insulation unit shall be mopped at a time.

There shall be not less than twenty-five (25) pounds of asphalt used per one hundred (100) square feet in the individual moppings.

When the incline of the roof exceeds three (3) inches in twelve (12) inches, the insulation shall be substantially secured to the steel deck with proper devices provided by the steel deck manufacturer.





# PREVENTION OF CONDENSATION UNDER ROOFS

## Determining the Thickness of Insulation

**NOTE**—Reprinted by special permission. Copyright, American Society of Heating and Ventilating Engineers, from the A. S. H. V. E. Guide, Vol. 36, 1930.

The approximate thickness of insulation required to prevent condensation on the interior roof surface of a building can be determined on the chart below used in conjunction with the Coefficients of Transmission of Various Types of Flat Roofs Covered with Built-up Roofing given in the table on page 37.

The following example will serve to illustrate:

Construction of uninsulated roof is—1 in. yellow pine roof boarding covered with built-up roofing.

Dry-bulb temperature near ceiling.....85 deg. Fahr.  
Relative humidity .....70 per cent.  
Lowest outside temperature.....—10 deg. Fahr.  
Coefficient of transmission roof.....0.485  
Conductivity of insulation to be used.....0.30

The solution of this problem is indicated on the chart by the dotted line:

(1) Locate the inside dry-bulb temperature of 85 deg. on scale A, and draw a line vertically downward to the 70 per cent relative humidity curve indicated on scale B of the chart.

(2) Draw line 2 horizontally from the intersection located as per paragraph 1.

(3) Locate on scale D the temperature difference of 95 deg. between the ceiling temperature of 85 deg. and the lowest outside temperature of —10 deg., and draw a line vertically downward until it intersects with line 2.

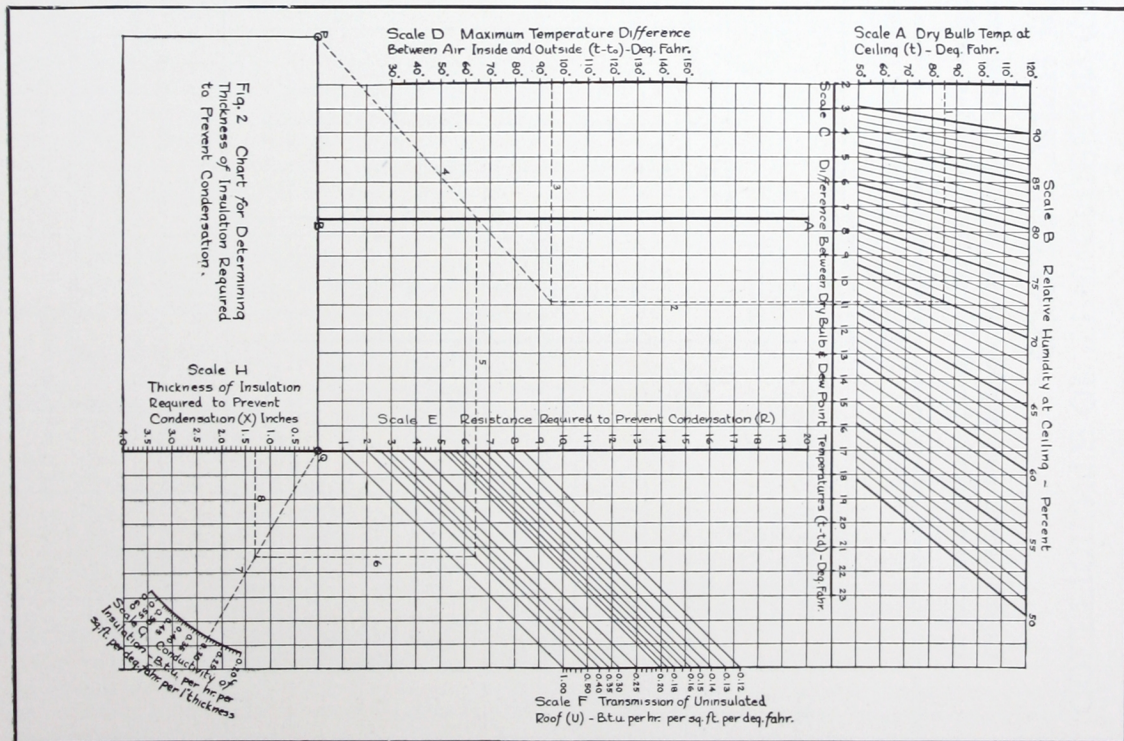
(4) From the point of intersection of lines 2 and 3, draw a line to the point P.

(5) From the intersection of lines 4 and AB, draw a line vertically downward until it intersects with the diagonal line corresponding to a coefficient of transmission of the roof of 0.485, located on scale F.

(6) From the intersection found as per paragraph 5, draw line 6 horizontally to the left.

(7) Locate the conductivity of 0.30 B.t.u. per hour, per square foot per degree Fahrenheit of the insulation on scale G and draw a line to point Q.

(8) From the intersection of lines 6 and 7, draw line vertically upward to scale H, on which the thickness of insulation of this conductivity is indicated, which is 1.3 in. The nearest commercial thickness above 1.3 in. would, of course, be selected.





## COEFFICIENTS OF TRANSMISSION (U) OF VARIOUS TYPES OF FLAT ROOFS COVERED WITH BUILT-UP ROOFING

Coefficients are expressed in Btu. per hour per square foot per degree Fahrenheit difference in temperature between air on the two sides, and are based on an outside wind velocity of 15 mph.

NO.	TYPE OF ROOF DECK	THICKNESS OF ROOF DECK (INCHES)	WITHOUT CEILINGS—UNDERSIDE OF ROOF EXPOSED					WITH METAL LATH AND PLASTER CEILINGS <sup>d</sup>				
			COLUMN A. NO INSULATION. COLUMN B. RIGID INSULATION (1/2 IN.) COLUMN C. RIGID INSULATION (1 IN.) COLUMN D. RIGID INSULATION (1 1/2 IN.) COLUMN E. RIGID INSULATION (2 IN.)					COLUMN F. NO INSULATION. COLUMN G. RIGID INSULATION (1/2 IN.) COLUMN H. RIGID INSULATION (1 IN.) COLUMN I. RIGID INSULATION (1 1/2 IN.) COLUMN J. RIGID INSULATION (2 IN.)				
			A	B	C	D	E	F	G	H	I	J
1	PRECAST CEMENT SLAB	1 5/8	0.85	0.37	0.24	0.18	0.14	0.43	0.26	0.19	0.15	0.12
2	CONCRETE CONCRETE	2	0.82	0.37	0.24	0.17	0.14	0.42	0.26	0.19	0.15	0.12
3		4	0.72	0.34	0.23	0.17	0.13	0.40	0.25	0.18	0.14	0.12
4		6	0.64	0.33	0.22	0.16	0.13	0.37	0.24	0.18	0.14	0.11
5	WOOD	1 <sup>(a)</sup>	0.49	0.28	0.20	0.15	0.12	0.32	0.21	0.16	0.13	0.11
6		1 1/2 <sup>(a)</sup>	0.37	0.24	0.18	0.14	0.11	0.26	0.19	0.15	0.12	0.10
7		2 <sup>(a)</sup>	0.32	0.22	0.16	0.13	0.11	0.24	0.17	0.14	0.11	0.097
8		4 <sup>(a)</sup>	0.23	0.17	0.14	0.11	0.096	0.18	0.14	0.12	0.10	0.087
9	GYPSUM FIBER CONCRETE <sup>b</sup> (2 IN.) ON PLASTER BOARD (3/8 IN.) GYPSUM FIBER CONCRETE <sup>b</sup> (3 IN.) ON PLASTER BOARD (3/8 IN.)	2 3/8	0.40	0.25	0.18	0.14	0.12	0.27	0.19	0.15	0.12	0.10
10		3 3/8	0.32	0.22	0.16	0.13	0.11	0.12	0.17	0.14	0.11	0.097
11		—	0.95	0.39	0.25	0.18	0.14	0.46	0.27	0.19	0.15	0.12
12	GYPSUM FIBER CONCRETE <sup>c</sup> (2 IN.) ON WEATHERWOOD INSULATION BOARD (1/2 IN.)	—	0.26	0.19	0.15	0.12	0.10	0.20	0.16	0.13	0.11	0.09
13	GYPSUM FIBER CONCRETE <sup>c</sup> (2 IN.) ON WEATHERWOOD INSULATION BOARD (1 IN.)	3	0.19	0.15	0.12	0.10	0.088	0.16	0.13	0.11	0.09	0.08

**Note:** Reprinted by special permission from the A. S. H. V. E. Guide. Copyright, American Society of Heating and Ventilating Engineers.

- (<sup>a</sup>) Nominal thickness specified—actual thicknesses used in calculations. (<sup>b</sup>) Gypsum fiber concrete—87 1/2 per cent gypsum, 12 1/2 per cent wood fiber.  
 (<sup>c</sup>) Coefficient of transmission of bare corrugated iron (no roofing) is 1.50 Btu per hour per square foot of projected area per degree Fahrenheit difference in temperature, based on an outside wind velocity of 15 mph.  
 (<sup>d</sup>) These coefficients may be used with sufficient accuracy for wood lath and plaster, or plaster board and plaster ceilings. It is assumed that there is an air space between the under side of the roof deck and the upper side of the ceiling.  
 (<sup>e</sup>) Numbers 12 and 13 were calculated by U. S. Gypsum Co. according to A. S. H. V. E. method but are not a part of the table from the A. S. H. V. E. Guide.



# USG 20 and 10-YEAR BONDED . . . BUILT-UP ROOF FLASHINGS

USG Built-up Roof Flashings are approved for application throughout the United States when installed in connection with USG Bonded Built-up Roofs.

. . .

## INTRODUCTION

### ESSENTIALS OF WATER-TIGHT WALLS ABOVE THE ROOF

**PARAPET WALLS**—Parapet walls to which built-up roof flashings are attached are one of the most vulnerable parts of a building. The walls are exposed to rain at the top and on both sides, and at times are subjected to freezing temperatures necessitating, as nearly as possible, water-tight construction.

Bureau of Standards' research paper R. P. 683, "A Study of the Properties of Mortars and Bricks and their Relation to Bond," establishes the weakest point in brick work to be at the junction of the solid masonry unit and the mortar.

Parapet walls should be built of the best materials. For all ordinary construction, regardless of the absorption rates of the masonry units, tests and numerous field observations made by competent authorities indicate that parapet walls can be made water-tight by the proper use of mortars which form a solid bond with the masonry units. Mortar mixes shown in the following table prepared by the National Lime Association are eminently satisfactory for this purpose:

**STANDARD MORTAR PROPORTIONS  
FOR ALL TYPES OF MASONRY**

TYPE OF MASONRY	Parts by Volume		
	Lime	Cement	Sand
For all weather-tight unit masonry above grade . . . . .	2	1	9
Same, richer for increased mortar strength . . . . .	2	1	7 or 8
Lime, 7 or 8 cu. ft. of putty per 180 lbs. of quicklime or 2.25 cu. ft. of putty per 100 lbs. of hydrate. Cement, 94 lbs. per cu. ft. Sand, 80-85 lbs. per cu. ft. loose and moist.			

**WALL COPING**—A water-tight coping is equally as important as the kind of masonry materials used in the wall. For a water-tight job, the coping should be laid tight on a full bed of mortar, thoroughly pointed up and properly pitched for drainage.

Copings should be provided with undercut drips. Continuous through wall flashings of fabric or non-corrosive metal should be placed between the coping and the brick work; or, in lieu of continuous flashings, unit pan flashings centered under the coping joints should be provided to prevent infiltration of water into the wall through the coping joints.

**FLASHINGS**—To be permanently efficient, flashing must:

1. Prevent water from entering the wall at the junction of the wall and the roof deck.
2. Prevent water from entering the wall through open joints in the coping.

The use of properly constructed roof flashings for these purposes cannot be too fully emphasized.

Most roof flashings have been designed to exclude water from the parapet wall, but the methods used have generally failed, resulting in the retention of the moisture that does get into the wall.

The application of hot asphalt, coal tar pitch, roofing felt or metallic materials over one face of the wall or across the top and continued down over one face of the wall actually accelerates disintegration of the masonry beneath the covered surface. If it is assumed that water does enter the wall, provision for its exit must also be considered. Therefore, covering one face of the wall reduces by one-half the area through which the water confined in the wall can escape.

Both faces of parapet walls should be exposed to the weather to permit maximum drying. Roof flashings should not be extended higher than is necessary to guard against the possible accumulation of water on the roof surface under unusual rainfall conditions.

**BITUMENS AND FELTS**—Specify the same bitumen and felts throughout. Where coal tar pitch is used, all felts should be saturated with the same material. Where asphalt is used, use asphalt saturated felts.



## USG FABRIC ROOF COUNTER-FLASHING • • DESCRIPTION

USG Built-up Flashings are manufactured from heavy woven cotton fabric, thoroughly saturated and coated with hot bituminous compound into which is pressed a uniform layer of mineral surfacing. The min-

eral surface retards rapid drying out of the saturants in the fabric and protects the exposed surface of the flashings from abrasive injury. Copper devices attached to the fabric provide anchorage in the raggle.

### *Flashing Specifications*

#### CORRELATIVE PROVISIONS APPLYING TO ROOF FLASHINGS

**NOTE**—*The construction of deck roofs, parapet walls, curbs, and other vertical surfaces upon or against which flashings are to be applied are not a part of the Roofing Contractor's work and are, therefore, not included in the USG Built-up Flashing Specifications. The following provisions, however, should be included as they apply under the proper heading of the specifications to be executed by others:*

**ROOF DECK PROVISIONS**—All provisions for the construction and finished condition of the various types of roof decks established under the heading "Correlative Provisions," pages 3 and 4, applying to "Built-up Roofing" shall apply likewise to "Roof Flashings."

**FLASHING RAGGLES**—The Masonry Contractor shall provide flashing raggles ½ in. wide by 1½ in. deep in all brick or concrete parapet walls, curbs, and other vertical walls above the roof deck surface in strict accordance with specifications established under this heading in "Correlative Provisions," page 4.

**NOTE**—*On saw-tooth and monitor curbs beneath the sash it is customary for the roofer to extend only the full thickness of the roofing up these inclined slopes without additional flashing reinforcement. While this construction is theoretically satisfactory, additional counter-flashing is needed over the roofing at these points to prevent damage by workmen performing the customary maintenance duties required over these particular sections of the roof.*

**NOTE**—*Where flashing raggles are to be provided in an existing wall, such as a party or parapet wall surrounding an old roof, the raggle can readily be cut by using a portable electric circular saw, substituting a carborundum disc for the steel saw blade. At re-entrant angles the raggles, obviously, will have to be raked out by hand.*

**NAILING STRIPS**—The Masonry Contractor shall provide permanent wooden nailing strips in all concrete parapet walls, curbs, or other vertical walls above the roof surface. Nailing strips are to be embedded in and flush with the face of the wall and located 1 inch below and parallel with the raggle groove in strict accordance with specifications established under this heading in "Correlative Provisions," page 4.

**CANT STRIPS**—Cant strips shall be provided by the General or Masonry Contractor at the junction of the roof deck with all vertical walls and curbs in strict accordance with specifications established under this heading in "Correlative Provisions," page 4.

### GENERAL REQUIREMENTS

#### APPLYING TO APPLICATION OF ROOF FLASHING

The Roofing Contractor shall consult with the General and Masonry Contractors at the time parapet walls, curbs, and other vertical walls are being erected and shall furnish the General and Masonry Contractors with sufficient information as to proper location of flashing nailing strips and raggles to assure their proper location and construction in relation to saddles or crickets installed later to effect drainage.

The Roofing Contractor shall also examine all walls or curbs upon or against which roof flashings are to

be applied. He shall determine that the walls or curbs are properly constructed, are smooth and free from sharp projections above or depressions in the plane of the wall or curb surface. He shall check the location and construction of flashing raggles and nailing strips to be certain that they are free from mortar, debris, and forming material and ready to receive the roof flashing. He shall notify the Architect of any defects he considers detrimental to the installation of the roof flashings and shall make sure that all defects are corrected before he begins work.



**BOND**—The Roofing Contractor shall furnish a United States Gypsum Company Built-up Roof Flashing Endorsement attached to the United States Gypsum Company Guaranty Roof Bond as called for under specifications for Built-up Roofing.

**NOTE**—The United States Gypsum Company will issue its Built-up Roof Flashing Endorsement not to exceed the term of the Guaranty Built-up Roof Bond in all localities of the United

States where its inspection service is available and whenever USG Bonded Built-up Flashings Nos. 20F or 10F are installed in connection with any USG Bonded Built-up Roof. The roofing and flashings must be installed by a Roofing Contractor approved by the United States Gypsum Company in strict accordance with its Bonded Built-up Roof and Flashing Specifications and subject to the United States Gypsum Company inspection, acceptance, and approval.

## MATERIALS AND APPLICATION

### USG Built-up Base Flashing

APPLYING TO SPECIFICATIONS NOS. 20F, 10F, 20M, 10FM

**NAILS**—Simplex flat head roofing nails or galvanized roofing nails driven through flat tin discs shall be used to secure the base flashings to the nailing strips or mortar joints in the wall. Nails shall be not less than 1½ in. long.

**TEMPERATURE OF BITUMEN**—Temperature of USG (Coal Tar Pitch) (Asphalt) shall never exceed 400 degrees Fahrenheit in the heating kettle.

**GENERAL**—All felt and fabric shall be laid without wrinkles or buckles.

All end laps of felt and fabric shall be not less than six (6) inches breaking joints in various plies.

All end laps of metal base and cap flashings shall be single or double lock seam construction.

**NOTE**—Deck Roofing Felts have been extended to the top of the cant strip or on all vertical walls four (4) inches under the various specifications for Built-up Roofs.

**BASE FLASHING**—Apply three (3) plies of USG (Tar) (Asphalt) Saturated Rag Felts weighing fifteen (15)

pounds per one hundred (100) square feet, single thickness, embedded in individual moppings of hot USG (Coal Tar Pitch) (Asphalt). Felts shall be applied in hot bitumen in separate strips not more than ten (10) feet in length and in unbroken widths extending from the lower edge of the raggle, down the wall, across the face of the cant strip, and out over and joined to the deck roofing in feathered edge construction. The first ply shall be extended out on the deck roofing not less than two (2) inches beyond the toe of the cant strip. The second and third plies shall both be extended not less than three (3) inches beyond the toe of the cant strip.

The base flashing felts shall be nailed at the top every eight (8) inches (in the horizontal or vertical mortar joints) (to the wood nailing strip) immediately below the raggle groove.

The exposed edge of the third or top ply of the base flashing extending out on the deck roofing shall be covered and additionally reinforced with a strip of felt not less than six (6) inches wide thoroughly and firmly embedded in and top coated with hot bitumen.

• • •

## Specification No. 20F

### USG 20-YEAR BONDED FABRIC COUNTER-FLASHING

(FOR DETAIL, SEE PAGE 42)

The counter-flashing shall extend from the raggle, down the wall, across the face of the cant strip and out over the deck roofing not less than two (2) inches.

Install USG 2 Ply Mineral Surfaced Extra Heavy Fabric Counter-flashing by bending the copper fastening device and inserting it full depth into the raggle in such manner that the flat base of the copper fastener shall set flush upon the lower lip of the raggle and the prongs on the upper section of the copper fastener shall make permanently tight contact with the upper lip of the raggle.

Completely fill the raggle groove with USG Plastic Caulking Compound forced or pressed into the groove with a trowel or wooden paddle.

The unattached flaps or sections of the counter-flashing shall be carefully lifted to permit a complete uniform mopping of hot bitumen to be applied over the surface of the underlying base flashing and between the two plies of the fabric counter-flashing. Into these moppings, while hot, the individual plies of the fabric counter-flashing shall be pressed and embedded so that at no point shall fabric touch felt or fabric touch fabric.



## *Specification No. 10F*

### **USG 10-YEAR BONDED FABRIC COUNTER-FLASHING**

(FOR DETAIL, SEE PAGE 42)

The counter-flashing shall extend from the raggle, down the wall, across the face of the cant strip and out over the deck roofing not less than two (2) inches.

Install USG 1 Ply Mineral Surfaced Extra Heavy Fabric Counter-flashing by bending the copper fastening device and inserting it full depth into the raggle so that the flat base of the fastener shall set flush upon the lower lip of the raggle and the prongs on the upper section of the fastener shall make tight contact with the upper lip of the raggle.

Completely fill the raggle groove with USG Plastic Caulking Compound forced or pressed into the groove with a trowel or wooden paddle.

The unattached flap or section of the counter-flashing shall be carefully lifted to permit a complete uniform mopping of hot bitumen to be applied over the surface of the underlying base flashing. Into this mopping, while hot, the fabric counter-flashing shall be pressed and embedded so that at no point shall fabric touch felt.

## *Specification No. 20M*

### **USG METAL BASE and CAP-FLASHING**

(FOR DETAIL, SEE PAGE 42)

Install a (16 oz. cold rolled copper) (specify metal) metal base flashing in strips not more than ten (10) feet long and in unbroken widths extending from the lower edge of the raggle, down the wall, across the face of the cant strip, and out over the deck roofing not less than four (4) inches. Metal base flashing shall be set and firmly embedded in a mopping of hot USG (Coal Tar Pitch) (Asphalt) and nailed to the roof deck every eight (8) inches. The full width of the edge on the deck roofing and the nails shall be covered with two (2) strips of (Tar) (Asphalt) saturated felt not less than eight (8) inches wide embedded in and top coated with a complete mopping of hot bitumen.

A (16 oz. cold rolled copper) (specify metal) Metal Cap-Flashing with a four (4) inch exposed apron, having a hemmed edge at the bottom, shall be installed and securely anchored in the raggle.

Completely fill the raggle groove with USG Plastic Caulking Compound forced or pressed into the groove with a trowel or wooden paddle.

**NOTE**—A Through Wall Flashing with a four (4) inch exposed apron, having a hemmed edge at the bottom, may be substituted for the cap-flashing set in a raggle above specified.

## *Specification No. 10FM*

### **USG FELT ROOFING BASE and METAL CAP-FLASHING**

(FOR DETAIL, SEE PAGE 42)

Apply one (1) ply of 75 lb. USG Mineral Surfaced Surfaced Roofing embedded in a uniform mopping of USG (Coal Tar Pitch) (Asphalt). The Mineral Surfaced Roofing base Flashing shall be applied in strips not more than ten (10) feet in length and in unbroken widths extending from the lower edge of the raggle, down the wall, across the face of the cant strip and out over the deck roofing not less than six (6) inches. The Mineral Surfaced base flashing shall be nailed at the top every eight (8) inches (in the horizontal or vertical mortar joints) (to the wood nailing strip) immediately below the raggle groove. This may be done at the same time that the underlying felt base flashing is nailed.

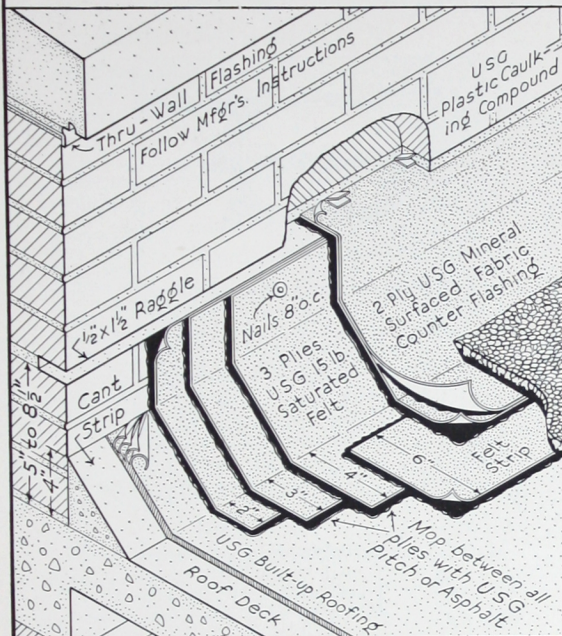
A (16 oz. cold rolled copper) (specify metal) Metal Cap-Flashing with a four (4) inch exposed apron, having a hemmed edge at the bottom, shall be installed and securely anchored in the raggle.

Completely fill the raggle groove with USG Plastic Caulking Compound forced or pressed into the groove with a trowel or wooden paddle.

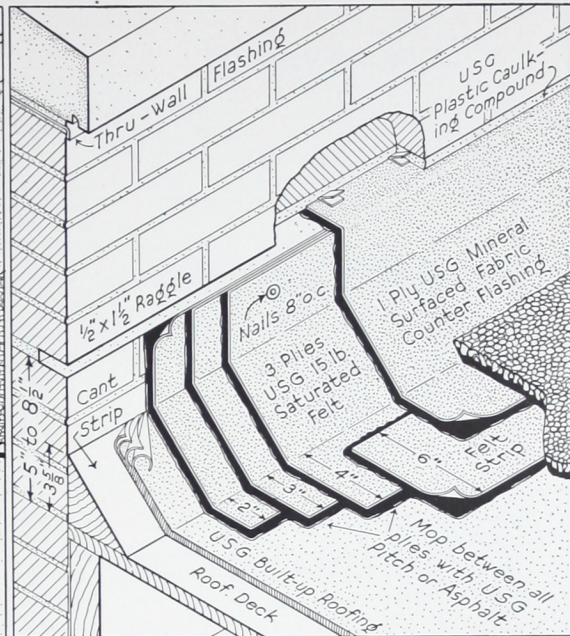
**NOTE**—A Through Wall Flashing with a four (4) inch exposed apron, having a hemmed edge at the bottom, may be substituted for the cap-flashing set in a raggle above specified.



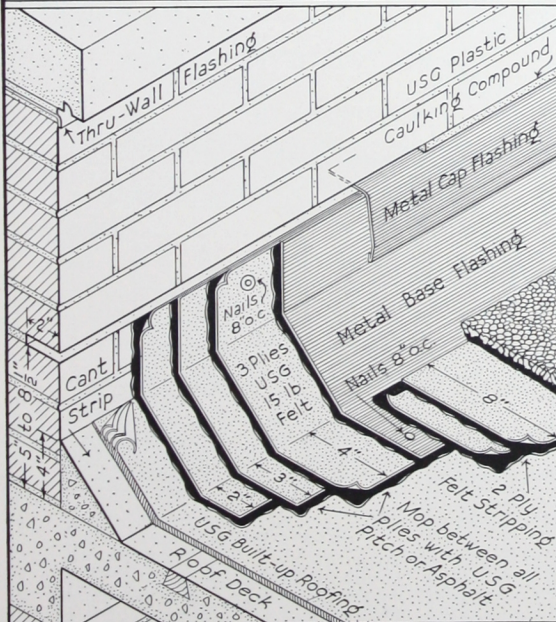
# USG FLASHING DETAILS



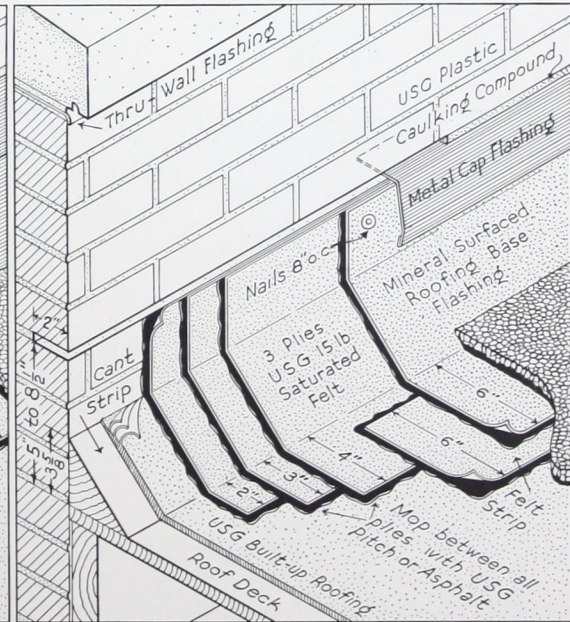
SPECIFICATION NO. 20F USG 20 YEAR BONDED FABRIC COUNTER FLASHING



SPECIFICATION NO. 10F USG 10 YEAR BONDED FABRIC COUNTER FLASHING



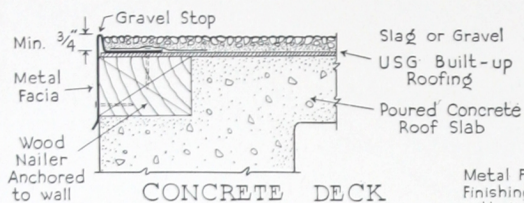
SPECIFICATION NO. 20M METAL BASE AND CAP FLASHING



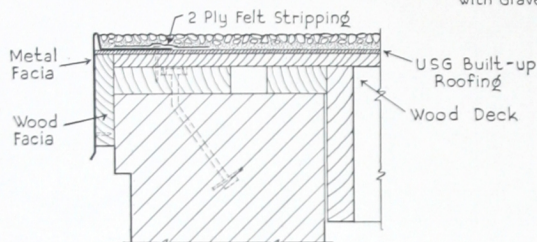
SPECIFICATION NO. 10FM FELT BASE ~ METAL CAP FLASHING



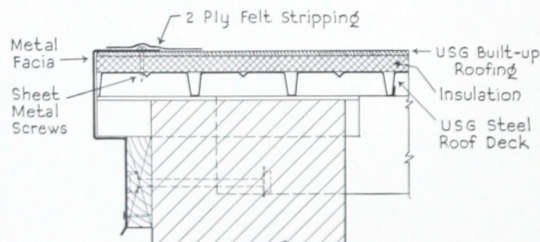
# USG FLASHING DETAILS



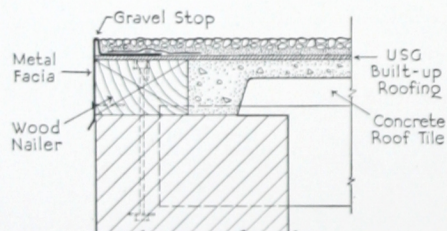
CONCRETE DECK



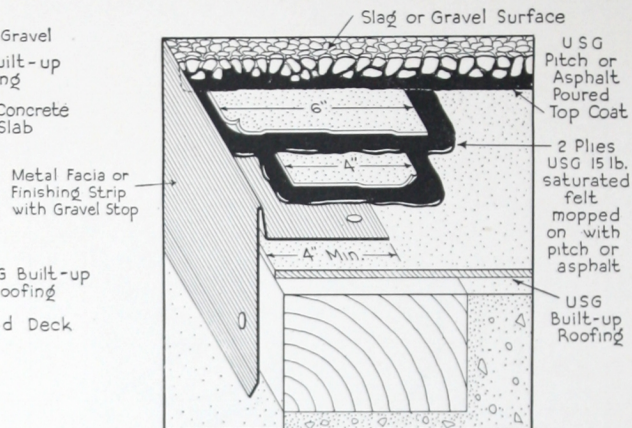
WOOD DECK



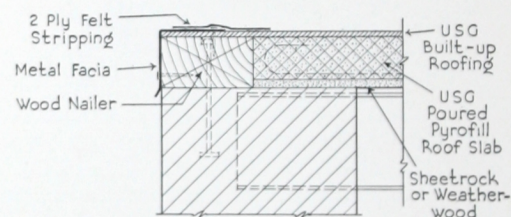
METAL DECK



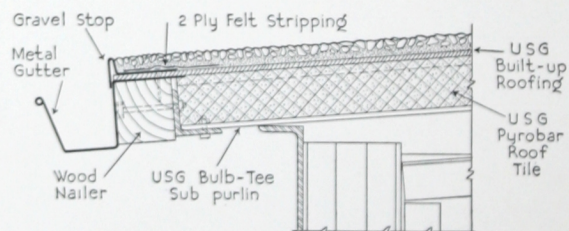
CONCRETE TILE DECK



DETAIL OF METAL FACIA SHOWING 2 PLY FELT STRIPPING

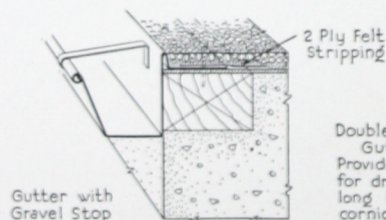


POURED GYPSUM DECK

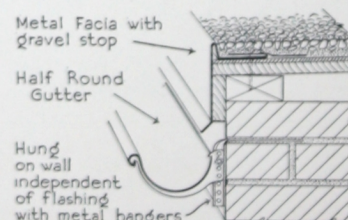
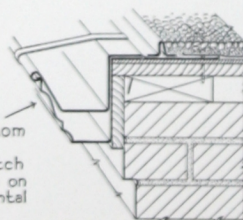


GYPSUM TILE DECK

## DETAILS OF ENDS AND EAVES OF VARIOUS TYPES OF ROOF DECKS



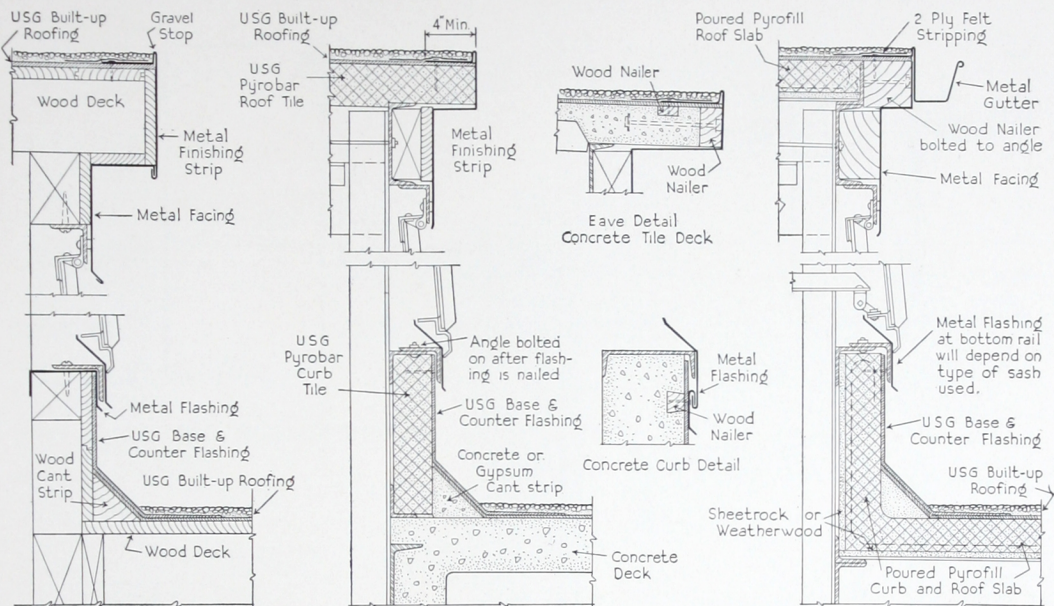
Double Bottom Gutter Provides pitch for drainage on long horizontal cornices



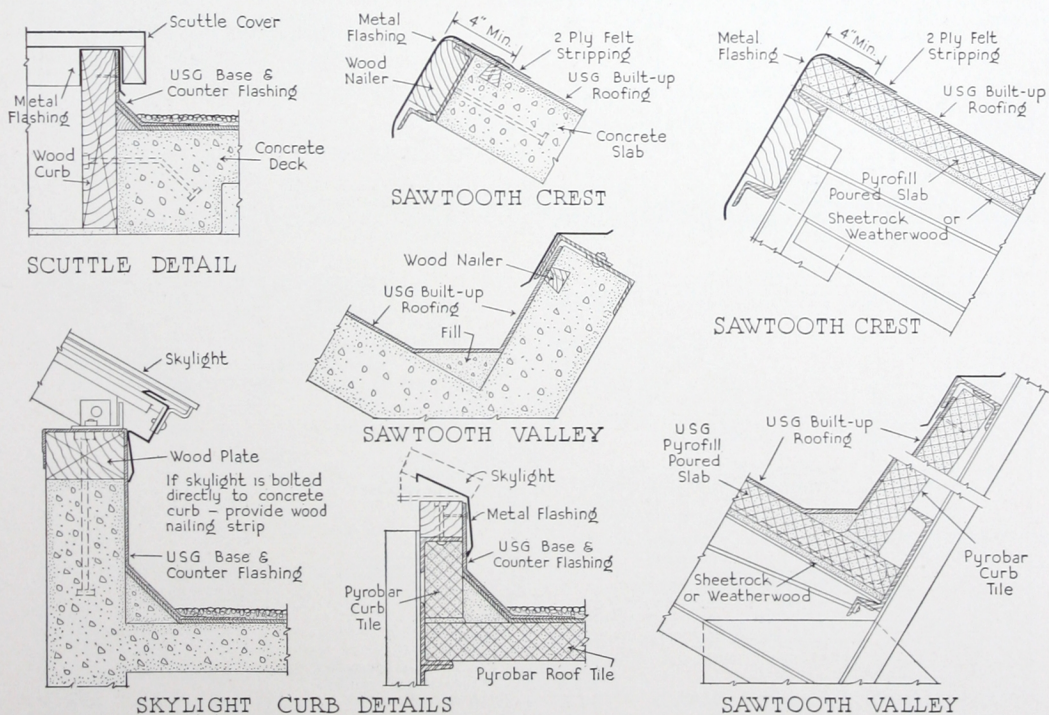
GUTTER DETAILS



# USG FLASHING DETAILS

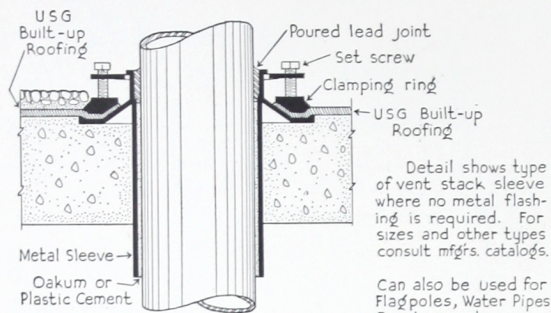


## DETAILS OF MONITOR CURB AND EAVE FLASHING

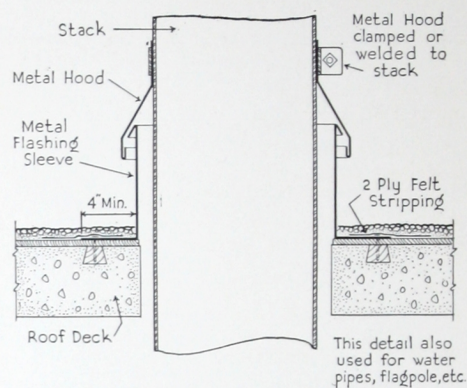




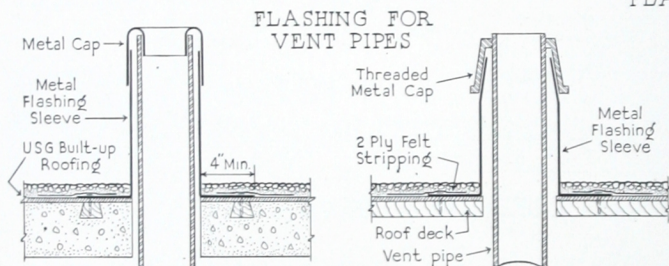
# USG FLASHING DETAILS



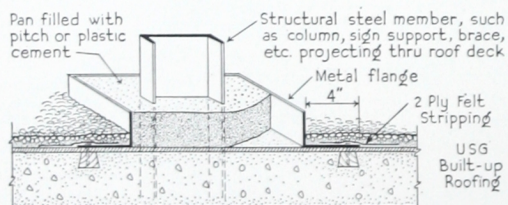
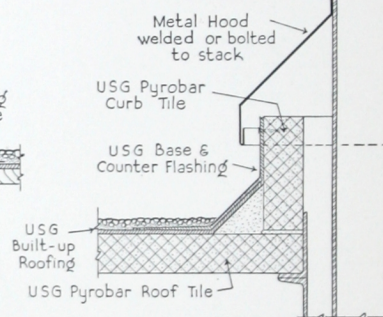
VENT STACK SLEEVE



FLASHING FOR STACKS



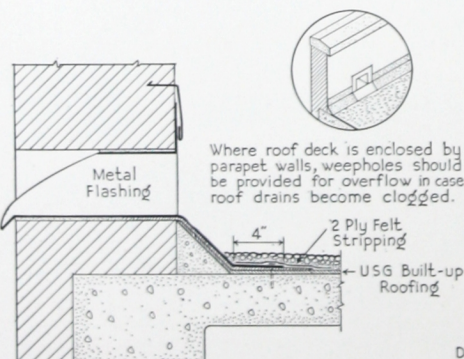
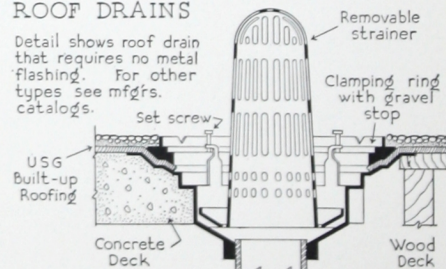
FLASHING FOR VENT PIPES



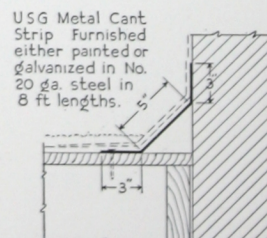
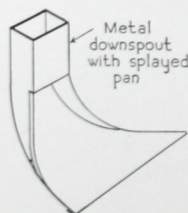
FLASHING FOR STRUCTURAL MEMBERS

## ROOF DRAINS

Detail shows roof drain that requires no metal flashing. For other types see mfgs. catalogs.



WEEPHOLE IN PARAPET WALL



METAL CANT STRIP



# UNITED STATES GYPSUM COMPANY

## Roofing Products

### STRIP SHINGLES

Quad Shingles  
Tapered Shingles  
4-in-1 Square Butt Shingles  
3-in-1 Square Butt Shingles  
Hexagon Shingles  
Thatch Shingles  
Tritab Shingles  
Brick Siding

### INDIVIDUAL SHINGLES

Arro-Lock Shingles  
Grip Lock Shingles  
Super-Tite Shingles  
Individual Shingles

### ROLL ROOFING

Hex-Roll Roofing  
Diamond Point Roll Roofing  
Style "A" Roll Roofing  
Sil-O-Elt Roll Roofing  
Adamant Mineral Surfaced Roll Roofing  
Paragon Mineral Surfaced Roll Roofing  
Zeen-X Corrugated Roll Roofing  
Imperial Mica Surfaced Roll Roofing  
Dixie Talc Surfaced Roll Roofing



Saturated Sheathing  
Building Papers  
Starter Strips

### BUILT-UP ROOFING

Asphalt Saturated Felt  
Tar Saturated Felt  
60 lb. Asphalt Saturated Base Sheet  
45 lb. Asphalt Saturated Base Sheet  
30 lb. Asphalt Saturated Base Sheet  
Mineral Surfaced Built-up Roll Roofing  
Sel-Vi-Lap Mineral Surfaced Cap Sheet  
Sanded Surfaced Asphalt Cap Sheet  
Asphalt Saturated Cotton Fabric  
Tar Saturated Cotton Fabric  
Asphalt  
Coal Tar Pitch  
Refined Coal Tar  
Fabric Roof Counter-flashing

### ROOF COATING and CEMENT

Roof Cement (Plastic)  
Asphalt Roof Coating  
Asbestos Fiber Coating  
Special Flashing Cement  
Plastic Caulking Compound

## General Commodities

### PLASTER BASES—PLASTERS PLASTERING SYSTEMS

Red Top Rocklath—Red Top Metal Lath and Accessories—  
USG Resilient Plastering Systems—Standard X Plastering  
System—Base Coat Plastering Materials—Plaster Finishes

### WALLBOARDS and SHEATHING BOARDS

Sheetrock—Joint Systems—Sheetrock Panelwood—Wood  
Grained Sheetrock—Sheetrock Resilient System—Insulating  
Sheetrock—Sheetrock Tile Board—Red Top Fiber Wall-  
board—Gyplap Sheathing

### ENGINEERING SALES DIVISION SOUND CONTROL SERVICE

USG Acoustone—Sabinite Acoustical Plaster—Quietite—Per-  
tattle—USG System of Sound Insulation—Trembar Resilient  
Machinery Mountings

### ENGINEERING SALES DIVISION FIREPROOFING PRODUCTS

Sheetrock-Pyrofill Roof Construction—Pyrobar Pre-Cast Roof  
Tile—Red Top Rib Floors—2-in. Metal Edge T and G Floor  
and Roof Tile—Hydrocal Mastic Flooring—Pyrobar Pre-Cast  
Ceiling Tile and 2½-in. T and G Floor and Roof Tile—USG  
Steel Roof Deck—Pyrobar Partition and Furring Tile—Pyro-  
bar Beam and Girder Fireproofing

### THERMAL INSULATION PRODUCTS

Weatherwood Insulating Board and Lath—Insulating Sheet-  
rock and Rocklath—Red Top Insulating Wood—Thermofill

### OTHER USG PRODUCTS

Paint Products—USG Red Top Basement Windows—Red Top  
Coal Doors—Red Top Mason's Line—USG Agricultural Hy-  
drated Lime—Ben Franklin Agricultural Gypsum—Industrial  
Products











UgS  
O